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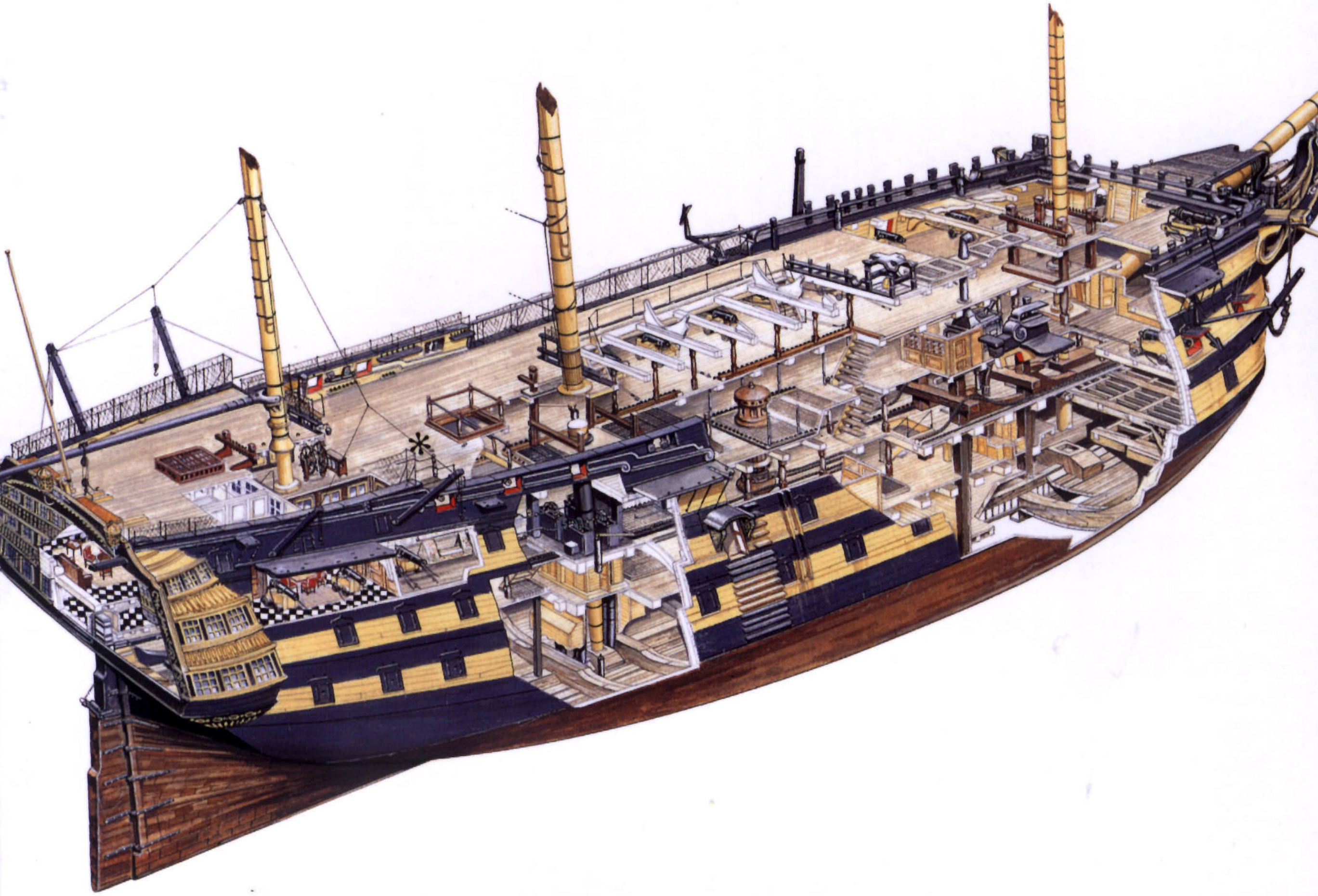
British Napoleonic Ship-of-the-Line



onstam • Illustrated by Tony Bryan

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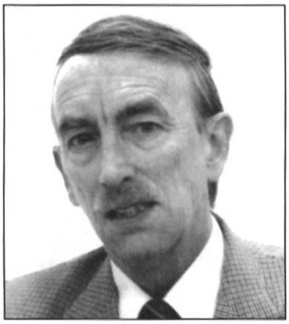

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CONTENTS

INTRODUCTION 3

DESIGN 4
- The Rating System
- The design of a ship-of-the-line
- Building a battle fleet
- Fleet strength
- Ship types

OPERATION 19
- Shipboard organisation
- Sailing a ship-of-the-line
- The ship-of-the-line in action
- Fighting the ship

THE FLEET 1792–1815 37

BIBLIOGRAPHY 42

GLOSSARY 42

COLOUR PLATE COMMENTARY 45

INDEX 48

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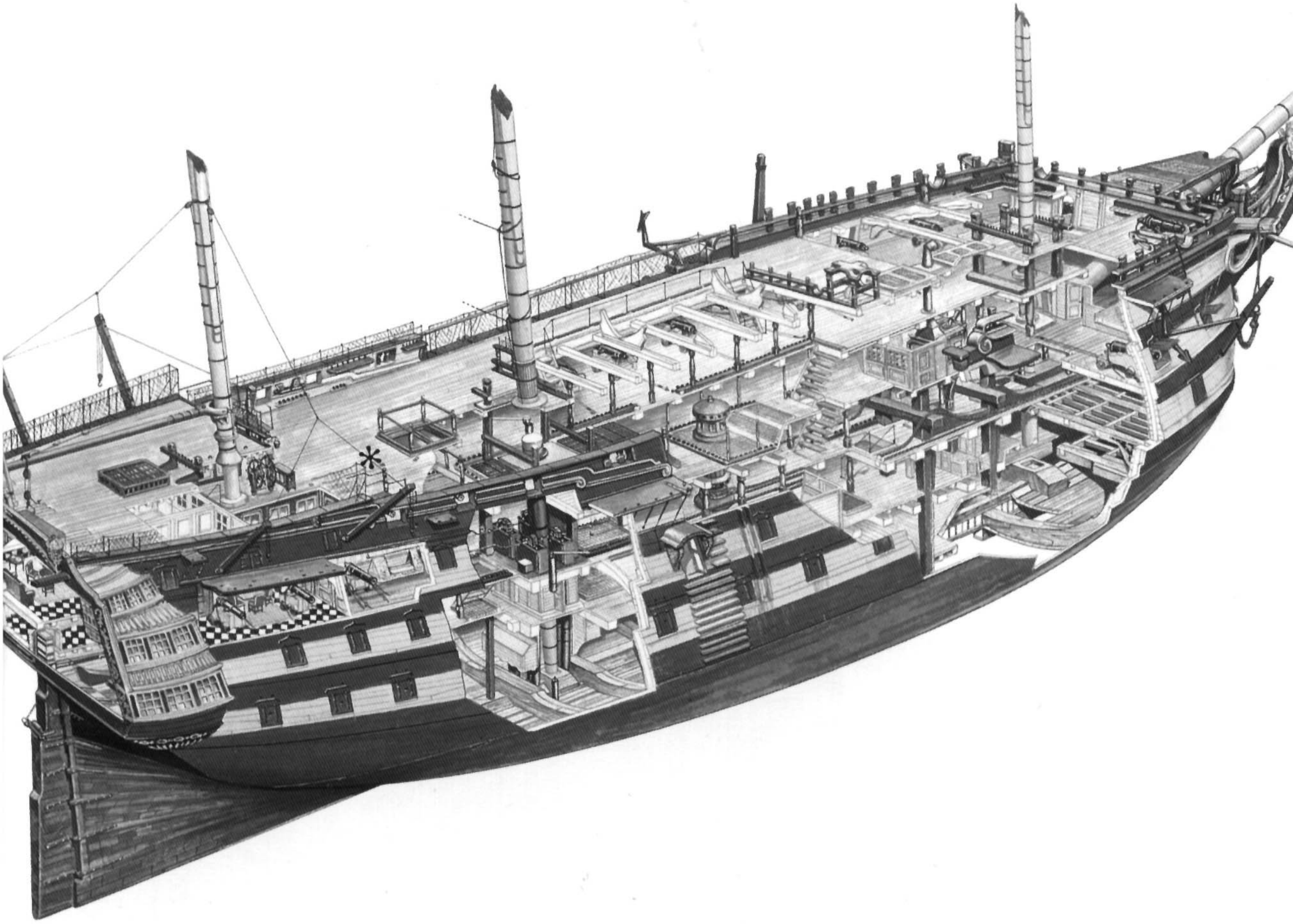

Angus Konstam • Illustrated by Tony Bryan

First published in Great Britain in 2001 by Osprey Publishing, Elms Court,
Chapel Way, Botley, Oxford OX2 9LP, United Kingdom.
Email: info@ospreypublishing.com

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CIP Data for this publication is available from the British Library

ISBN 1 84176 308 X

Editor: Simone Drinkwater
Design: Melissa Orrom Swan
Index by Alan Rutter
Originated by Magnet Harlequin, Uxbridge, UK
Printed in China through World Print Ltd.

04 05 06 07 10 9 8 7 6 5 4 3 2

FOR A CATALOGUE OF ALL BOOKS PUBLISHED BY OSPREY MILITARY
AND AVIATION PLEASE CONTACT:

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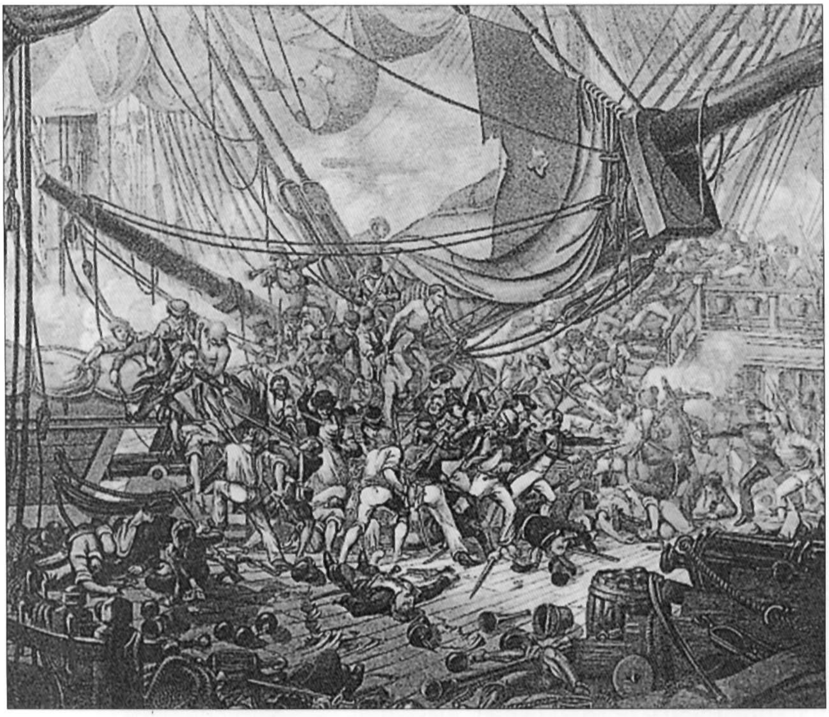
BRITISH NAPOLEONIC SHIP-OF-THE-LINE

INTRODUCTION

Carved into the face of the building above the parade ground of the Royal Naval College at Dartmouth is an inscription that reads, 'It is on the Navy, under the good providence of God, that our wealth and peace depend'. Attributed to Charles II, it originated from the Admiralty's Navigation Act, written during his reign (1660–85). In the 17th century the maintenance of seapower was considered of paramount importance for the nation, and the bulwarks of the Restoration fleet were the large wooden walls, the ships-of-the-line. A century and a half later, this reliance on the navy was even more important, as nothing else stood between Napoleon's veteran armies and the shores of Britain. More than the frigates and the vital small vessels of the Royal Navy, these massive warships, the 'wooden ships and iron men', protected the country from invasion, and thwarted the overseas ambitions of the French. Although the British army under Wellington campaigned in Spain and Portugal for six years, and later defeated him at Waterloo (1815), Britain's main contribution to Napoleon's defeat was the denial of the seas to France and her allies. A string of victorious fleet actions won by British ships-of-the-line and the continual blockade of French ports choked French commerce, and ensured secure communication and transportation between Britain and her continental allies. Seapower was the key to victory, and the British ship-of-the-line was the ultimate arbiter of maritime supremacy.

This book outlines the design and development of these complex war machines and explores their operational use, through a study of crewing and gunnery. An analysis of the ships' handling under sail and of their construction is not appropriate here, but sources covering these aspects are listed in the bibliography.

Captain Nelson leading a boarding party from HMS *Captain* (74 guns) onto the waist of the Spanish 80-gun ship-of-the-line *San Nicolas*, during the battle of St Vincent, 1797.



DESIGN

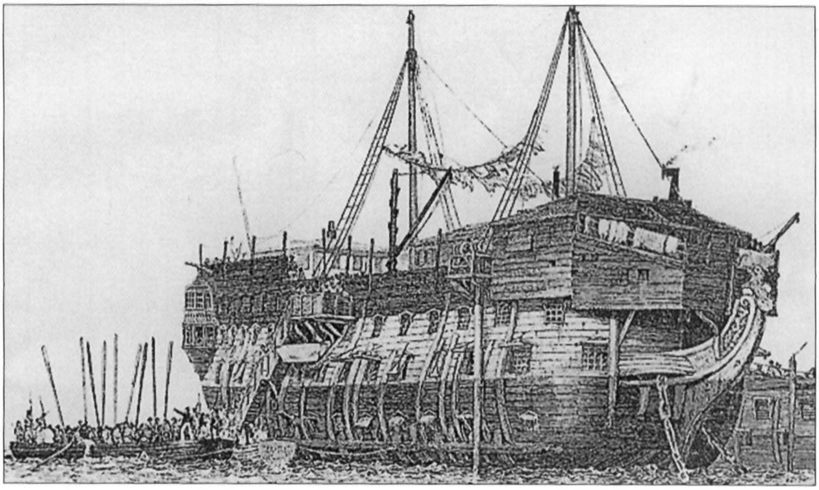
At the start of the French Revolutionary War (1792–1802), the British navy was the largest fleet in the world, with 146 'ships-of-the-line', plus hundreds of smaller warships. The term was a new one, reflecting the emergence of 'line ahead' tactics during the Dutch wars of the mid-17th century. Since then, British fleets had made the best use of their firepower by entering battle with their ships 'in line'. To maintain a place in the 'line of battle', a warship needed to have a heavy armament, and be strong enough to withstand the battering of enemy fire. The size of vessels deemed capable of taking their place in a line of battle changed over time. During the Seven Years War (1756–63) ships of 50–60 guns were the largest ships-of-the-line, and participated in major fleet actions. By 1793, they were no longer powerful enough to take part in fleet actions, except when no other vessels were available. By then, the 64-gun ship was considered the smallest vessel that could stand in battle line. The standard ship-of-the-line during the French Revolutionary War and the Napoleonic War (1803–15) was the 74-gun ship-of-the-line. In other words, by the start of the period, the established definition of a ship-of-the-line was a warship with at least two continuous gundecks.

In the Rating System introduced during the mid-17th century, warships were classified as first, second or third rates. There were exceptions, such as the 50-gun fourth rate HMS *Leander* that fought in the battle-line at the battle of the Nile in 1798. Although ships-of-the-line sometimes operated independently, or acted as convoy escorts, their primary purpose was to form part of a line of battle, and to engage the enemy in a fleet action. Everything about them, their design, armament, organisation, crewing and performance was centred on this primary function. Although big, expensive and difficult to maintain, they were vital to the phenomenal success of the Royal Navy during the period.

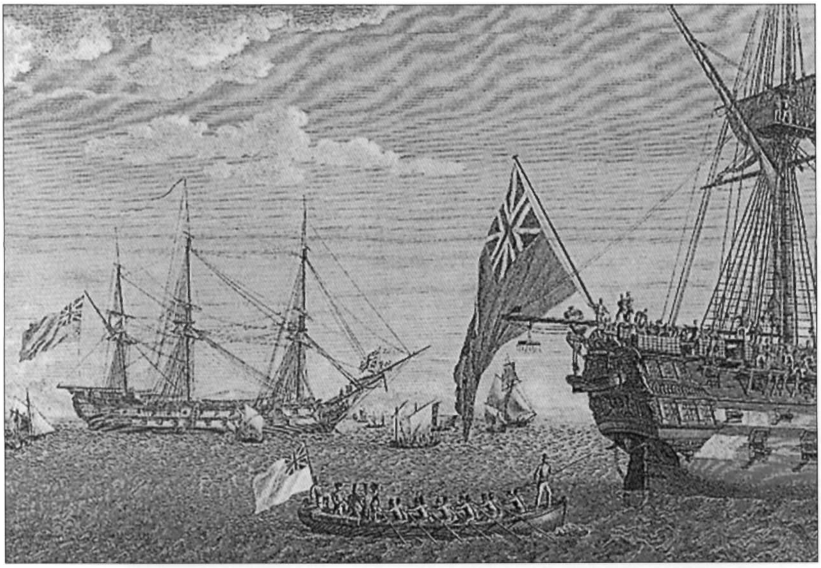
The Rating System

When Britain entered the French Revolutionary War in 1793, the Royal Navy consisted of 498 warships, either in commission or 'in ordinary', the contemporary term for a warship which has been 'mothballed' (although it also included vessels used for non-combat roles, such as depot ships, prison ships or receiving ships). At the peak of its strength in 1813, the Royal Navy possessed 1,017 warships. With the exception of a handful of specialist ships such as bomb vessels, all warships carrying 20 guns or more were 'rated', a classification that defined ships according to their size and armament. By definition, all rated ships were commanded by post captains (full captains), and

Many of the ships-of-the-line, which helped establish British naval supremacy during the period, were decommissioned after the war, and used for other purposes. HMS *York* (74 guns), launched in 1807, was decommissioned in 1819, and converted into a prison ship.



were square-rigged, three-masted vessels. The Admiralty also used the system to determine the crewing quota for each class of vessel, which in turn was linked to administrative concerns, such as pay and the quantity of supplies the ship was allocated.



After his surrender to the captain of the 74-gun HMS *Bellerophon* off Rochefort in 1815, Napoleon was transferred to HMS *Northumberland* (74 guns) off Plymouth for his journey into exile on St Helena.

First rates and second rates were three-deckers (with three continuous gundecks), while third and fourth rates were two-deckers. Theoretically, they were all regarded as ships-of-the-line, but during the war the smallest third rates were gradually relegated to secondary duties such as escorting convoys, or 'showing the flag' overseas. By 1793, fourth rates of 50–60 guns were considered too small to form part of the line-of-battle, and were rarely used in fleet actions. Fifth rates and sixth rates were usually frigates, with a single gundeck, but as the Napoleonic era progressed smaller frigates were increasingly regarded as obsolete. The rest of the fleet, the brigs, cutters, transport ships and other vessels that performed a less dramatic but vital role in the establishment and maintenance of seapower, were un-rated. There were problems with the rating system, as an 80-gun third rate needed virtually the same crew as a 90-gun second rate, yet was classified alongside ships of only 64 guns. Also, a frigate armed with 24-pdr. guns and carronades was more powerful than a fourth rate vessel.

A more accurate method of calculating the power of a sailing warship was by classifying the guns it carried. Ships were commonly referred to by the nominal number of guns they mounted (74, 64, 80, etc.). This was particularly true for third rates and fifth rates, where the armament could vary widely among vessels within the same rate. To the sailor of the Napoleonic era, the term '74' was markedly different from a '64'. This armament usually only took account of guns carried on the main gundecks of the vessel, and guns mounted on the quarterdeck or forecastle were often ignored for classification purposes. The introduction of carronades further confused the issue; they were often mounted on these interrupted upper deck locations and were therefore not included as part of the ship's classification. In addition, some 74s mounted 18-pdr. guns on their middle (main) gundeck, while others carried 24-pdrs, so the firepower of a ship of the same 'rate' could vary considerably. Some naval historians classified ships by the broadside weight of iron the guns could fire, but again, the inclusion of short-range but powerful carronades made the classification system very subjective and no ideal solution was ever devised.

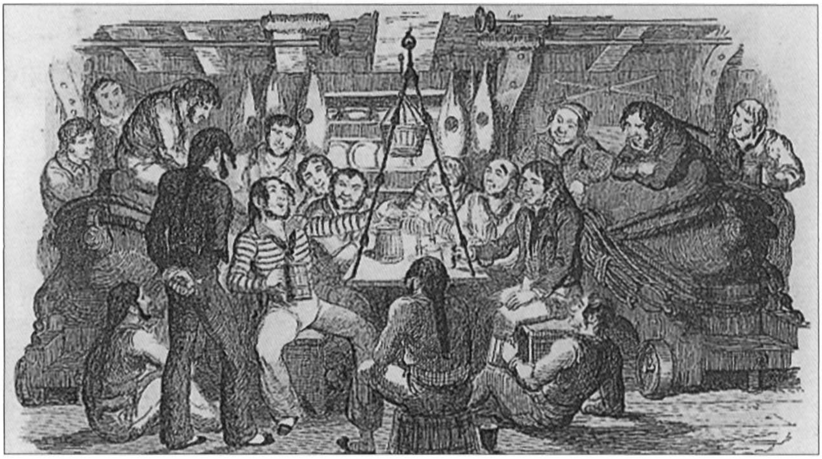
The rating system and strength of the line-of-battle fleet (ships-of-the-line) at the start of the French Revolutionary War was as follows. For all its faults, the system remained in use throughout the period, from 1793–1815.

The design of ships-of-the-line

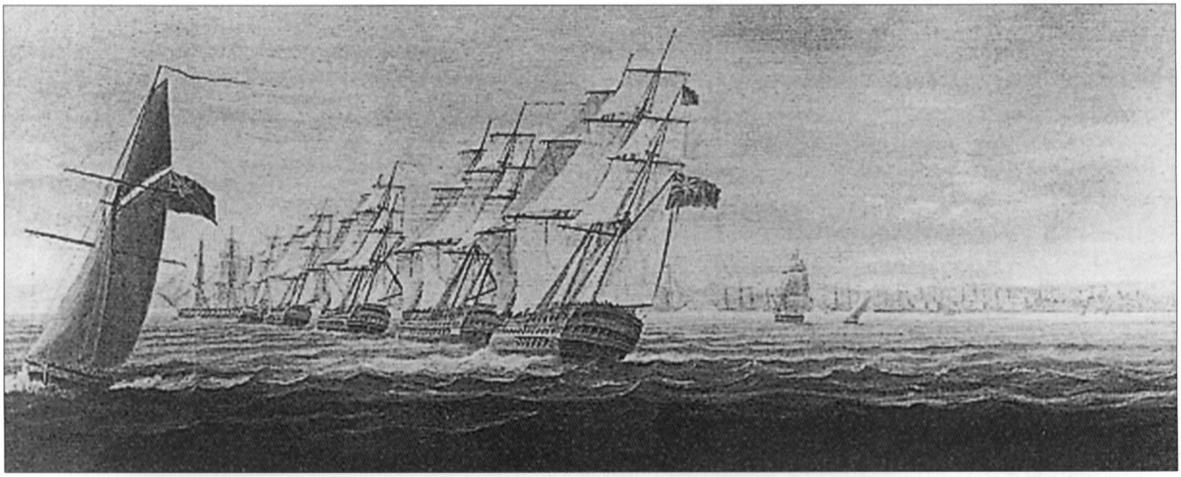
It took almost a century to grow the timber required to build a ship-of-the-line, and the construction of a new warship could take several years. In commercial terms, the cost of a 74-gun ship-of-the-line in 1793 was placed at just under £50,000 (£25 million or $40 million in today's terms). In other words, wooden ships-of-the-line did not simply 'grow on trees'. If the country went to war, a fleet could not be built overnight, although crewing was less of a problem, as a maritime nation such as Britain in the late 18th century could draw on an extensive pool of experienced seamen when required. The Royal Navy needed to maintain a 'fleet in being', ready for action with little warning, and in 1793 it contained 146 major warships. While many of these were almost half a century old, a continual programme of ship design and building meant that the fleet contained a core of modern warships, designed according to the latest principles of naval engineering. The design of these ships was important, as they could remain in service for decades. For example, by 1815, HMS *Victory* had been in service for over half a century.

Rate	Guns	Tonnage	Crew	Length (ft)	No. in Fleet
First Rates	100 guns or more	2,100–2,750	750–875	178–205	5
Second Rates	98 guns	1,900–2,150	750	178–185	17
	80 guns	1,900–2,000	650	181	4
Third Rates	74 guns	1,400–1,900	500–600	168–176	64
	64 guns	1,350–1,400	500	160	37

The design of any ship-of-the-line was influenced by certain considerations, such as the ideal balance between armament and sailing performance. Its primary purpose was to deliver a heavy volume of shot against an enemy warship, so almost exclusively ships-of-the-line carried their armament in a broadside battery, on two or three decks. This configuration influenced fleet tactics, and while less than ideal, it remained a constant factor – as it had for centuries. For reasons of stability, the heaviest guns were carried as low as possible in the ship, so a typical 74-gun ship-of-the-line mounted 32-pdrs. on its lower deck, 18–24-pdrs. on its main deck, and 12-pdrs. or carronades on the quarterdeck or forecastle. The guns and carriages were extremely heavy, so gundecks had to be heavily supported. Similarly, hull sides had to be thick enough to absorb as much enemy fire as possible, so hull width was a vital consideration. The beam of the ship was dictated by the space needed to work the armament, yet the narrower the hull, the faster the ship



Seamen berthed on the gundecks, and mess tables were slung between the guns, as shown in this engraving. The tankards shown were used for rum, or beer if spirits were not available.



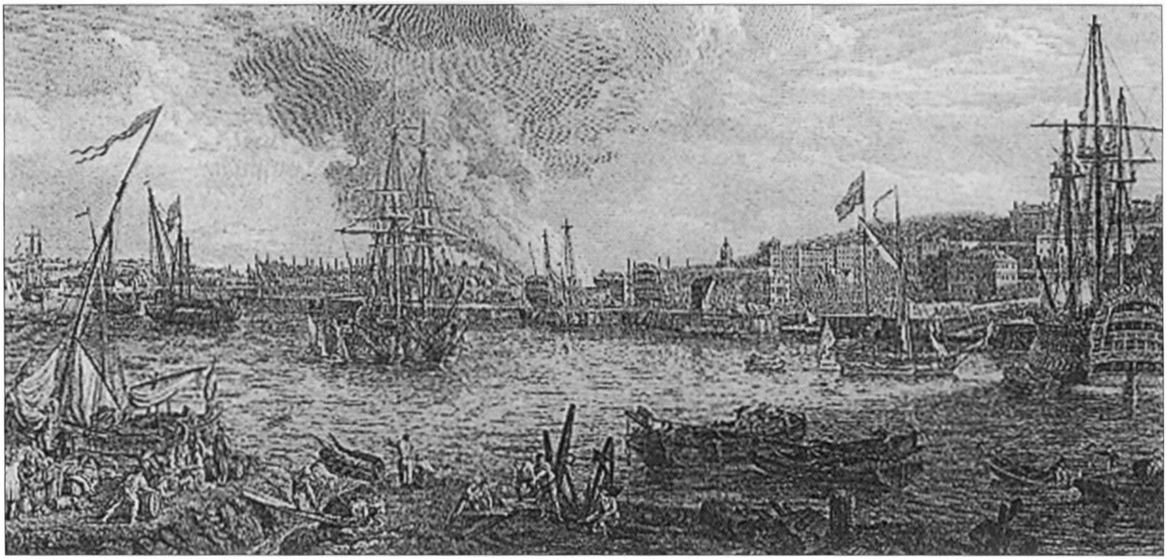
While ships-of-the-line were designed to fight in fleet actions, most British line-of-battle ships spent most of the war blockading enemy ports. The inshore blockading squadron at Cadiz, July 1797. Oil painting by James Buttersworth.

could be propelled through the water. The typical ratio of length to breadth of a ship-of-the-line during this period was between 3.5 and 4 to 1.

Given these constraints, a series of British naval engineers tried to improve on previous vessels, and warship design during the late 18th and early 19th centuries was a slowly evolving process. Naval architecture was the province of a small group of shipwrights, most of whom began their careers in one of the royal dockyards. While the design of un-rated ships could be left in the hands of regional designers, all larger vessels were conceived in the Navy Office, part of the Admiralty in London. The office was run by the Surveyor of the Navy, and from 1755, a succession of surveyors designed the wooden ships-of-the-line used by the great 18th century admirals.

Almost every major warship (apart from those copied directly from captured French vessels) was designed under the supervision of the surveyor. First, the Admiralty would specify what type of ship it wanted, and provided an outline of its basic specifications, such as beam, length, size of gundecks and armament. The surveyor and his staff in the Navy Office would draw up a ship model and a series of plans (mainly sheer lines and hull lines), then submit them for approval to the Navy Board. Copies of the plans were then sent to the shipyards where the vessel or vessels of that class of ship were to be built.

In 1745, the Admiralty effectively froze warship development by adopting the '1745 establishment', where old ships had to be replaced by new vessels of a similar design. At that time the majority of third rates were 70- and 60-gun ships. In 1755 Sir Thomas Slade was appointed Surveyor of the Navy, a post he held until 1771. In collusion with his fellow surveyor Sir William Bately and probably the First Sea Lord, Lord Anson, he planned to overturn this 'establishment', which he saw as a restriction on the development of the battle fleet. Within a month of his appointment he was ordered to produce plans for two 70-gun ships. Instead he designed ships of 74 guns, with 28 gunports on each main gundeck, and 18 on the forecastle and quarterdecks. The result was the Dublin class of warships, the first 74-gun ships commissioned into the Royal Navy. The Seven Years War in 1756 led to the widespread adoption of the 74-gun design, and subsequent third rates designed by Slade and Bately retained this gun configuration, but the size of the vessels

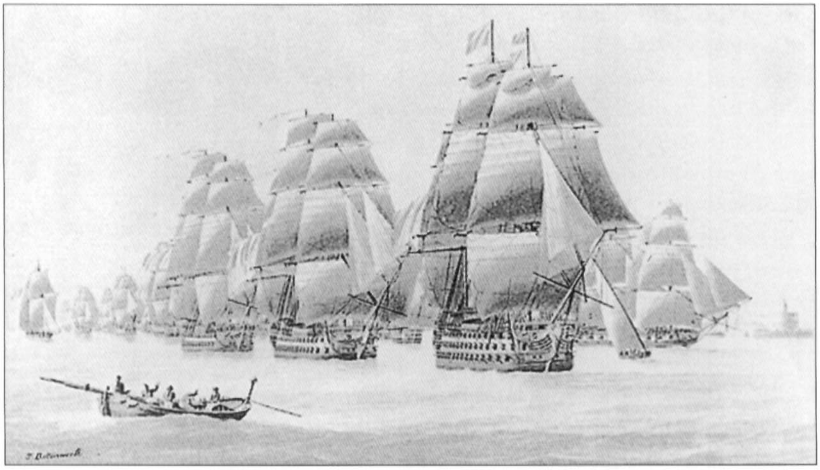


His Majesty's Royal Dockyard at Chatham, c.1790, viewed from the private yards on the Frindsbury bank of the River Medway. Ships under construction, ships 'in ordinary' and those ready for sea are all depicted in the panorama.

increased. Anson and Slade's vision overcame conservative opposition and constituted a virtual revolution in warship design. After initial teething problems, the new 74-gun ships proved a success, producing an ideal compromise between armament and sailing abilities. Their vessels played a significant part in the war, and when HMS *Bellona* (a Slade-designed 74-gun ship) captured the larger French *Courageux* (74 guns) in 1761, it seemed that any British ship could overcome an opponent of similar size or greater. As naval historian Brian Lavery put it, the decisive victory at Quiberon Bay (1759) against a fleet of approximately equal strength was 'the first in a long line of British victories over the French, which was to end at Trafalgar… Anson had given the Navy new ships, and a new spirit, and transformed it into a devastating fighting force, which Nelson was to use even more effectively'.

Slade's success with the 74-gun ship-of-the-line was repeated in other sizes and rates of warships. 64-gun ships replaced 60-gun warships, and continued to be produced until 1785. Slade's Ardent class and Sir John Williams' Intrepid class were well-designed and popular ships, many of which saw service after 1793. Slade also designed 90-gun second rates, but he only conceived one first rate in all his years in office. This was HMS *Victory*, a vessel that was considered a masterpiece of design, whose performance exceeded those of third rates, while carrying a broadside armament of 100 guns.

Following the death of Lord Anson in 1792, innovation was less well received, and later surveyors copied the 74-gun ships designed by Slade with only minor modifications. The American Revolution prompted an increase in the strength of the Royal Navy, with commissioning reaching a peak in 1782. Sir Edward Hunt and Sir John Williams, the successors to Slade and Bately, revised the dimensions of 64s and 74s, which had remained relatively unchanged, and produced larger vessels. While the construction of 64-gun ships ended with the launch of HMS *Nassau* in 1785, the new surveyors concentrated on increasing the size and stability of 74s, while upgrading 90-gun and 100-gun ships-of-the-line. In 1778, most 90-gun ships were converted into 98-gun vessels, making them effectively the same as 100-gun first rates. Carronades were introduced in 1779, and the Admiralty ordered all ships-of-the-line to carry between six and eight of the short-range guns, 68-pdrs. where possible, and 42-pdrs. or 32-pdrs. elsewhere.



HMS *Ville de Paris* at the head of the Channel Fleet off Spithead, c.1796. Carrying 110 guns, this first rate, launched in 1795, was the largest vessel in the navy at the time.

The experience gained in the American Revolutionary War led to an increasing emphasis on the larger ships-of-the-line, particularly when it was discovered that the French were replacing their wartime losses by building three-deckers. The Admiralty commissioned Hunt to design and build a series of new first rate ships-of-the-line. Together with surveyor Sir John Henslow he was also commissioned to design a new series of improved second rates. A less successful development was their experimentation with 80-gun vessels, and although several plans were proposed, only HMS *Caesar* was launched by 1793. Captured French vessels had a profound impact on British naval design during this period, as their vessels tended to be larger, and provided more stable gun platforms than their British equivalents. Although warships produced by all the major maritime powers were essentially similar, contemporaries often claimed that French and Spanish ships were superior to British designs. The *Courageaux*, captured in 1761, served as a template for four British copies (the Colossus class), all of which played a prominent part in the naval war, 1793–1815. The French ships were much vaunted as possessing the perfect 74-gun design, and their lines influenced the Surveyor's class of 1806 (also known as the 'Forty Thieves' due to corruption during construction of the 40 vessels). The real difference between British and foreign designs was the role of the ship itself. British vessels were designed to stay at sea for long periods, in all weathers. French and Spanish ships-of-the-line were more impressive, but were less suited to lengthy deployments, and lacked the space for provisions required by ships on blockade.

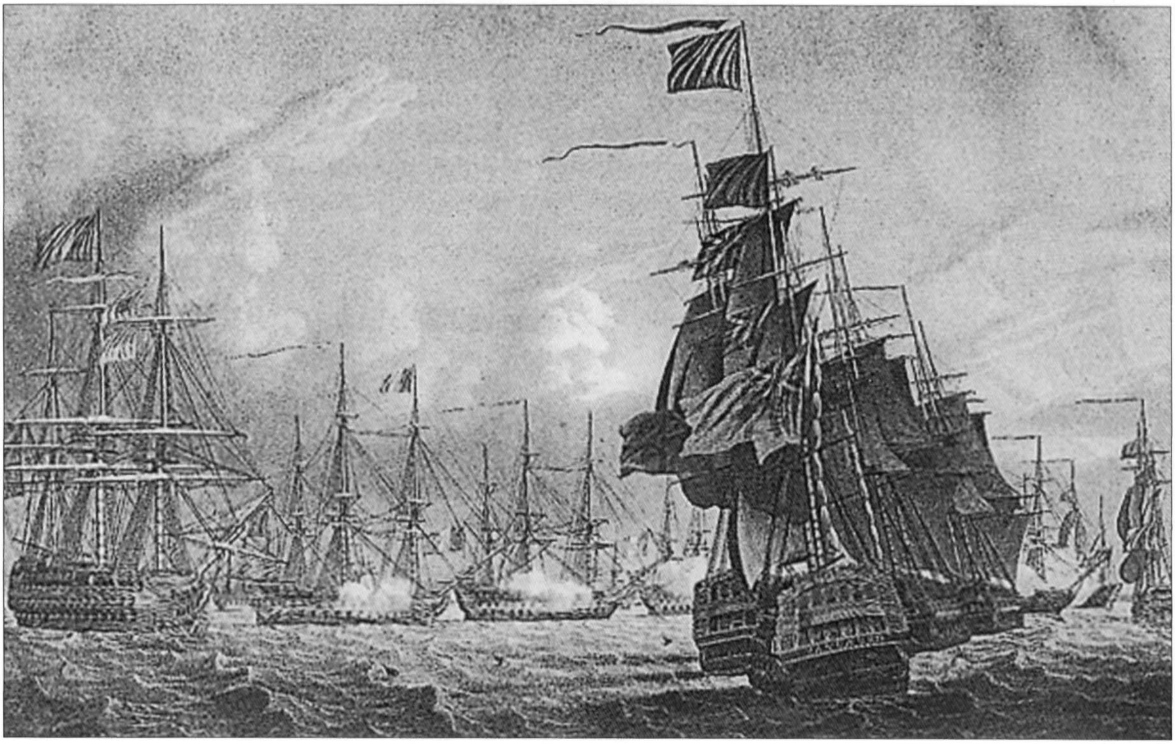
Following the outbreak of war in 1793, a new batch of ships was commissioned, including those copied from captured French vessels. The trend of enlarging warships in line with continental practice continued during the 1790s, and as the Admiralty employed two surveyors (Henslow and Sir William Rule), each was given the freedom to develop their own designs. Neither were skilled naval architects, and apart from Rule's HMS *Caledonia*, neither designer produced original, innovative designs. The problem with this period of experimentation was that by lengthening the size of warships, designers were pushing the limitations of wooden shipbuilding technology beyond their limits. To some extent this was overcome by the introduction of diagonal bracing in warship hulls, but many of the later vessels were far less successful than the earlier (and smaller) ships designed by Slade. The wholesale adoption of the Courageaux design (first conceived in 1753) for later

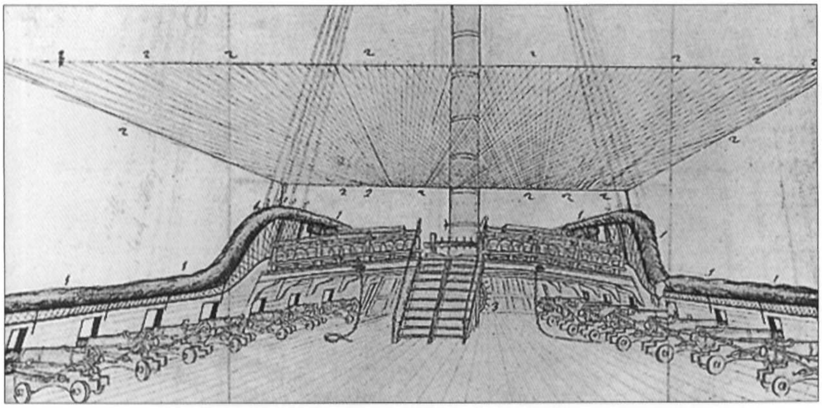
Napoleonic ships-of-the-line marked an end of this period of hull expansion. It was also indicative of a lack of indigenous designing talent. Sir Henry Peake worked with Rule on the Surveyor's class as a joint venture, and the modifications to the original French designs bore some of the trademarks of 'design by committee'. Sir Robert Seppings advocated the use of iron instead of wood for knees and braces, and although his system of construction was adopted in 1811, the war was over before ships built according to his specifications could join the navy. Seppings' methods allowed the construction of ships that were far larger than anything produced during the war. In the decades that followed, the 74-gun ship that established British naval supremacy was rendered obsolete by a new generation of massive first rates, dwarfing anything which came before. Although its era was past, the 74-gun ship of the line is remembered as the epitome of British naval supremacy during the period. Without these ships-of-the-line, ultimate victory in the Napoleonic War would have been impossible.

Building a battle fleet

The construction process began when the Admiralty approved the plans and model supplied by the Surveyor of the Navy. Copies were sent to the dockyard, and turned into templates for the frames, which (like ribs on an animal) formed the shape of the hull. Shipwrights built moulds to conform to these, then built the frames to fit inside them. While this was going on, the builders laid the keel, a series of huge, straight pieces of elm scarf-jointed together, running the length of the ship. A 'stempost' and 'sternpost' were attached to either end of the keel, delineating the length of the ship. The frames (which were usually installed in sections)

In this representation of the battle of the Nile (1797), the British fleet are shown in line ahead, approaching the van of the French fleet. Nelson's flagship HMS *Vanguard* (74 guns) is shown in the rear of the first division of the British line. Another eight ships-of-the-line followed on behind her.



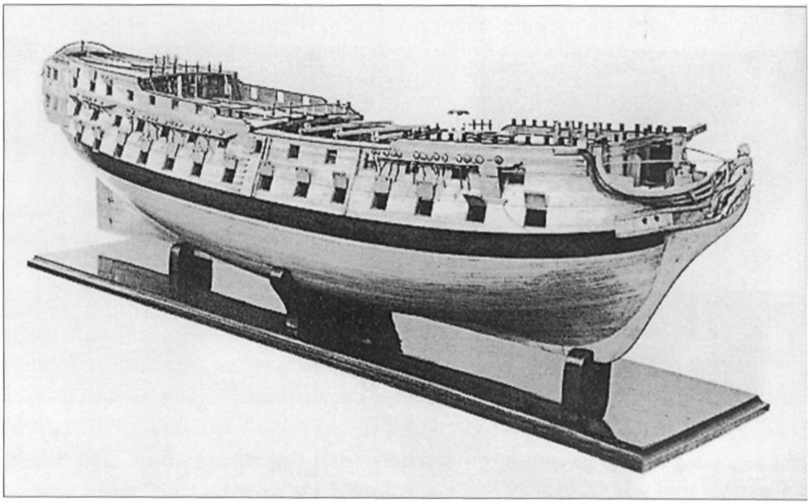


This engraving of HMS *Venerable* (74 guns), drawn c.1812, depicts her quarterdeck after being prepared for action. All of the quarterdeck cabins have been 'struck down' in the hold, and netting has been rigged to protect the gun crews from falling rigging or splinters.

were then attached to the keel, and held in place by bolting them to a series of 'ribbands', or horizontal supports, which ran in parallel bands from stem to stern. At this stage the transom was built over the stern, which provided the final support for the ribbands. Each parallel set of frames was joined together by a series of deckbeams or transoms, starting with the upper ones. The basic framework of the ship was now complete, in a process that could take a year or more. Floor timbers laid on the keel provided additional support. Next, a series of intervening 'half frames' were installed, pierced to accommodate the gunports, and secured in place to the ribbands. Once further framing was completed at the bow and stern, the ship would be left for several months, to allow the timbers to season.

The next step was to add the 'strakes' (planks) to the outside of the frames. On a 74-gun ship, the strakes were around 8 in wide, and varied in length from 20–33 ft. They were steamed to conform to the curve of the hull, then bolted in place. The thickest strakes formed the gunwales, placed where the ship's decks were fitted. The whole system was then reinforced by a series of 'riders', additional mini-frames that braced the strakes even further, and reduced the tendency of the keel to bend ('hog') under the weight of the rest of the ship. Each deck was then planked, starting from the lowest, and working up. Supporting beams and knees emanated from the main frames, created a strong platform on which guns could be mounted. The decks were slightly cambered, so water would run off, and over the side, through holes pierced in the gunwales. Supports were provided for the masts, capstans and other major features before the ship was launched. Ships-of-the-line were launched stern first, and were then towed away to a royal dockyard for the fitting of the masts, guns and the myriad smaller items required to make a ship-of-the-line operational. The process from the approval of a ship by the Admiralty to its commissioning was usually four or five years in times of war, and longer if there was less pressure on all parties to complete the job in a reasonable time.

In peacetime, all Royal Naval warships were built in one of the royal dockyards (Woolwich, Chatham, Deptford, Plymouth or Portsmouth). In wartime, while first and second rate ships continued to be built under close supervision in the major dockyards, space in the yard was also needed for the maintenance of the fleet. Fleet size usually increased during wartime, so the demands on royal dockyards increased. Consequently many third rate warships and almost all smaller vessels were built in private yards. In order that naval constructors could supervise the work in these private yards, a naval overseer was appointed for each construction project. The majority of work was given to yards located close to the larger royal dockyards, so that dockyard constructors could keep a close eye on progress. The largest private yard in Britain during the period was the Perry Yard at Blackwall in London, which usually served the needs of the East India Company. It was capable of building several ships-of-the-line simultaneously. Other popular Thames yards were the nearby Randall Yard at Rotherhithe, and several smaller yards at Deptford, Northfleet and Gravesend. Smaller yards in other parts of the country were also pressed into service. For example, HMS *Agamemnon* (64 guns) was built in the Adams Yard at Buckler's Hard in Hampshire, as was HMS *Swiftsure* (74 guns), which was launched in 1804. The majority of private yards were on the Thames, Medway, Solent, as well as in Plymouth and Southampton.



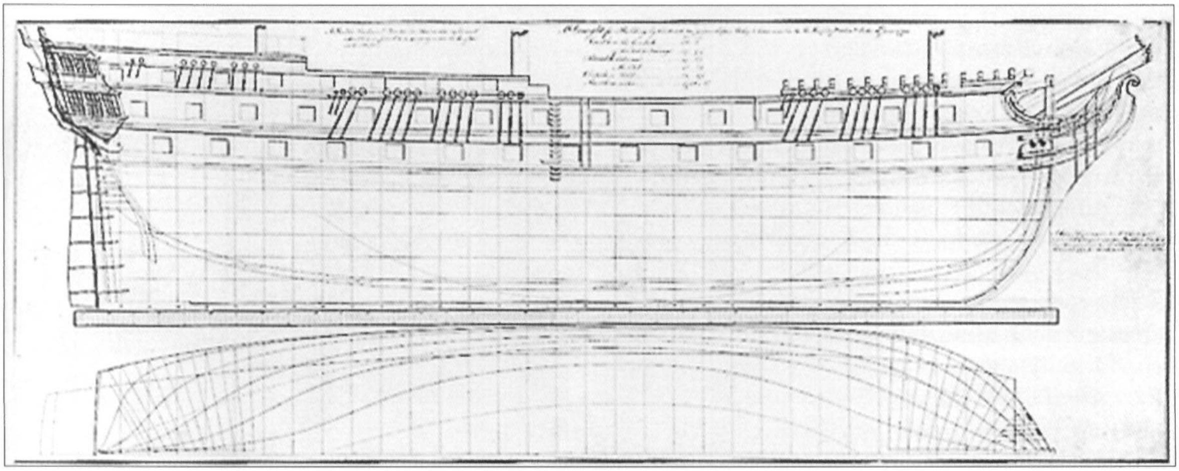
A model of the third rate HMS *Egmont*, one of the 'Common' 74-gun ships-of-the-line designed by Sir Thomas Slade. She was launched in 1768, and participated in the battle of Cape St Vincent in 1797. (Science Museum, London)

The procedure for allocating work was by competitive tender, and in most cases the lowest tender secured the job. Bribery was not unknown, but yards with a record for poor workmanship were not invited to tender, or their tenders were rejected. Payments were made in pre-arranged stages as work progressed. Despite the navy's reliance on private yards in wartime, they were often viewed with suspicion. The failure of the Surveyor's class of 1806 was blamed on corruption in private shipyards, and the substitution of green timber for seasoned oak. While bad workmanship, the use of poor materials and corruption were certainly prevalent, they were not the exclusive preserve of private yards.

The construction methods used on British ships-of-the-line is too vast a subject to be covered here, but the bibliography lists several relevant works which explore the subject in detail. A growing problem during the period was the supply of suitable timber. By tradition, ships-of-the-line were built using oak, but as oak supplies dried up towards the end of the Napoleonic War, teak from India was sometimes used as a substitute. British timber proved insufficient for the needs of the navy, and from the middle of the 18th century oak was imported from overseas. In particular, the Baltic region proved a valuable source of raw materials for naval shipbuilders. Consequently, the establishment of naval supremacy in the Baltic was an important consideration for British strategists during the period.

Fleet strength

For centuries, the navy tended to reduce its strength in peacetime, and commission new ships in wartime, or when war seemed imminent. Although it was common to lay down an 'establishment' with a minimum number of ships for each class in the fleet, the system was subject to financial cutbacks. Older vessels were also kept in service to maintain a 'paper strength' long after they ceased to be useful as operational warships. The conflict spawned by the American Revolution forced a



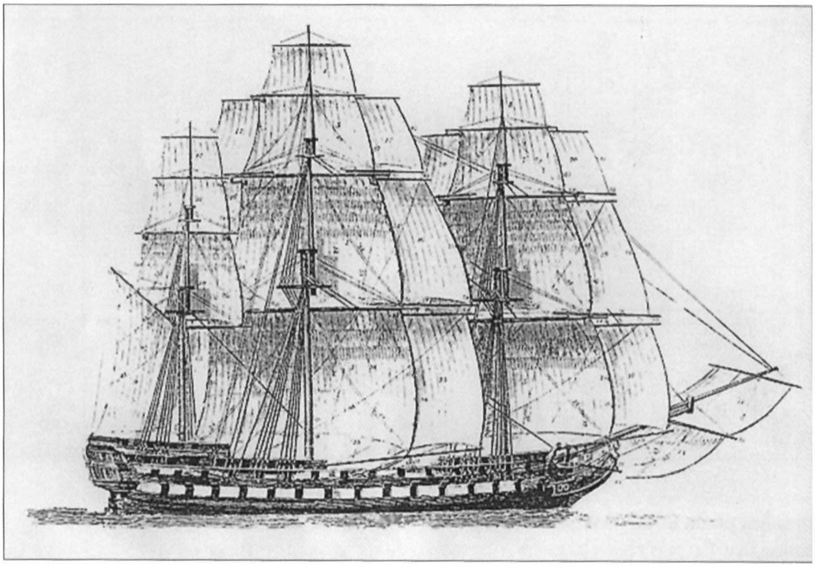
Draught plans of the Pompée class: two 74-gun ships (*Superb* and *Achilles*) launched in 1789. Their design was copied exactly from the French *Pompée*, captured in 1793.

re-evaluation of this system, and the way the fleet was maintained. Obsolete vessels were scrapped, and a shipbuilding programme took advantage of the latest innovations in naval architecture. The outbreak of the American Revolution in 1775 had caught the navy by surprise, and it took several years for it to expand into a force capable of tackling the Americans, French, Spanish and Dutch simultaneously. In 1793, the lessons of this war had been learned, and the line of battle strength was kept at a level sufficient for the strategic needs of the country.

By the start of the French Revolutionary Wars, the Royal Navy boasted a fleet of 146 ships-of-the-line, many of which were new, powerful warships, although a third were laid up or 'in ordinary' (mothballs) when war was declared. Peacetime costs were defrayed by keeping ships 'in ordinary'. They were moored to buoys off the Royal Dockyards, stripped of their rigging and maintained by a skeleton crew. In wartime they could be crewed, fitted out and sent to sea within a matter of months. 'Guardships' were kept fully rigged and partially crewed and provisioned. If ordered, they could be ready for active service within a few days if a crew could be found, but this system fell into disuse during the war.

When the Peace of Amiens ended the French Revolutionary War in October 1801, the Royal Navy had 180 ships-of-the-line, although many were due to be scrapped because of their age and poor condition. Most had been built before 1783, and the cost of maintaining this ageing fleet was increasing every year. During the war, many of the older ships were placed 'in ordinary', or reduced in rate as their timbers became too fragile to carry their allotted armament. Some were even converted into troopships. 24 new ships were on the stocks in 1793, and would be launched over the following three years. In May 1803 Britain declared war on France. As many of the ships-of-the-line had been placed 'in ordinary', it took several months for the Royal Navy to recover its strength of a year before. As new ships became available, the old stalwarts of the Slade era were retired from service, and decommissioned. The introduction of the Surveyor class of 40 third rates of 74 guns ensured that the navy maintained its supremacy over the French and their allies throughout the war. Although there were no major fleet actions after 1805, these new ships-of-the-line ensured that the blockade of the continent was maintained.

Ship types



A 74-gun third rate shows the full suite of square sails. These include studding sail extensions on all the principal sails of the foremast and mainmast. From A. Rees, ***Naval Architecture*** (London, 1819). (Author's Collection)

First rates were the Royal Navy's largest warships, and the pride of the fleet. Carrying 100 guns or more on three continuous decks, with other guns (usually carronades) mounted on their forecastles and quarterdecks, these vessels were capable of a devastating broadside. They were usually used as flagships, and were concentrated in the Channel and Mediterranean fleets, with at least one in each fleet at any one time. Their sheer size made them difficult to handle, but the firepower they provided was vital to the success of many of the navy's fleet actions during the period. The first true first rates were introduced into the fleet in the 17th century, but all the vessels built from 1760 were larger, with facilities for carrying flag officers and their staff. HMS *Victory* was the archetypal 100-gun vessel, although she was also a particularly good sailing vessel, capable of performing better than much smaller warships. Designed by Sir Thomas Slade and commissioned in 1765, she was so successful that her lines were copied (and slightly enlarged) by Sir Edward Hunt, when he designed the two second rates of the Boyne class some 25 years later. HMS *Britannia*, launched in 1762, was a more sluggish vessel, and her design was not repeated, although she remained in service until 1825.

HMS *Royal Sovereign* (launched in 1786) and the *Queen Charlotte* (launched four years later) were designed by Hunt, and were similar to the *Victory*, but these 100-gun first rates were the last of a breed. Later first rates were larger, and carried a heavier armament. HMS *Ville de Paris* launched in 1795 (and named after the French flagship captured at the battle of the Saintes in 1782), was 20 ft longer than the *Victory*, and carried 110 guns. The same lines were used on the slightly longer *Hibernia*, launched in 1804. Even larger 120-gun ships-of-the-line were laid down, but were never completed during the war. The largest of all operational first rates was HMS *Caledonia*, a 120-gun warship designed by Sir William Rule and launched in 1808. The lengthening of first rate hulls in the late 18th century pushed conventional maritime engineering using traditional methods of construction to the limit. Any larger, and hulls were liable to 'hogging' (sagging). The solution, which allowed the building of 110- and 120-gun ships, was to strengthen hulls with diagonal braces, a system introduced by naval surveyors during the last decade of the 18th century. The *Victory* was refitted in 1801 to take advantage of these new methods.

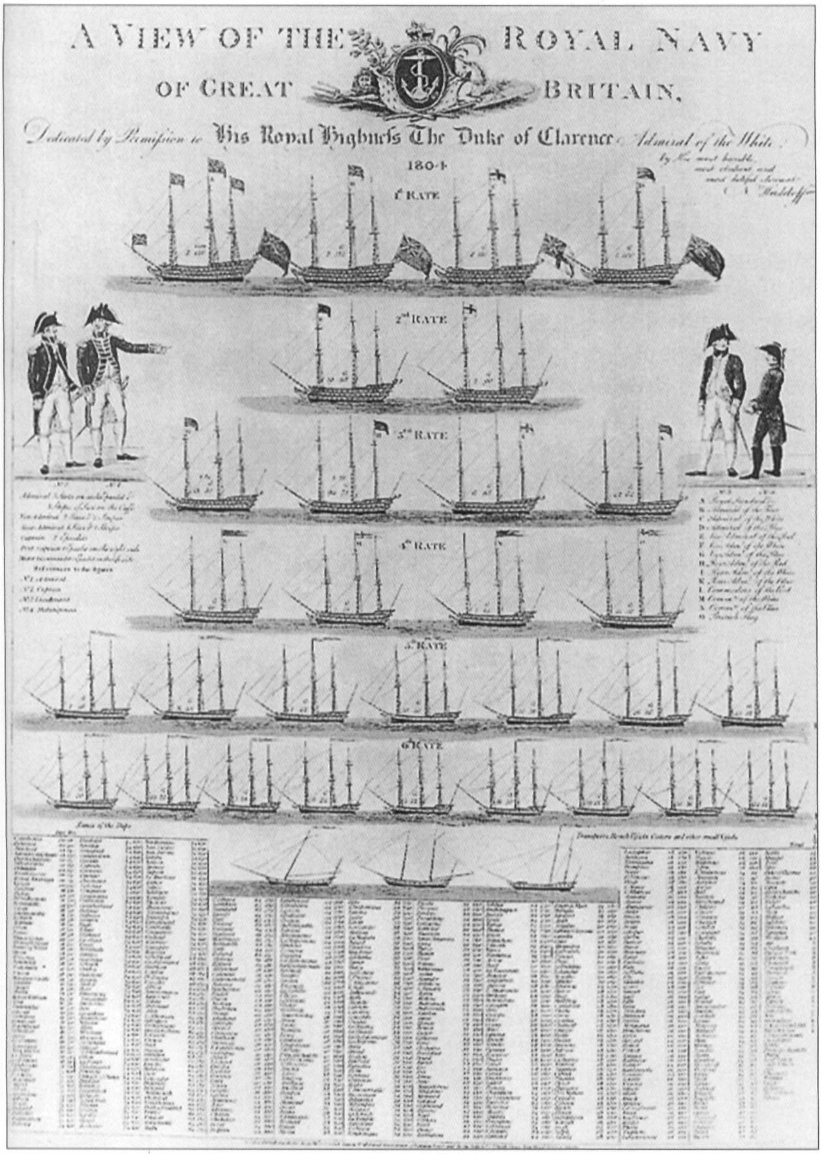
First rates mounted 32-pdrs. on their lower gundecks, after experiments with 43-pdrs. were abandoned due to their slow rate of fire. The middle gundeck housed 24-pdrs., with 12-pdrs. on the upper deck.

This gave the *Victory*, for example, a broadside weight (the total weight of shot fired from one side) of 1,104 lb (excluding carronades), while the *Caledonia* fired a 1,202 lb broadside. In addition to British-built first rates, the French *Commerce de Marseilles* (the largest ship then built) was captured at Toulon in 1793, and the Spanish *Salvador del Mundo* and *San Josef* (both 112 guns) were captured at the battle of St Vincent in 1797. Although no British first rate was lost to the enemy, HMS *Queen Charlotte* caught fire at her moorings and exploded off Leghorn (Livorno) in 1800.

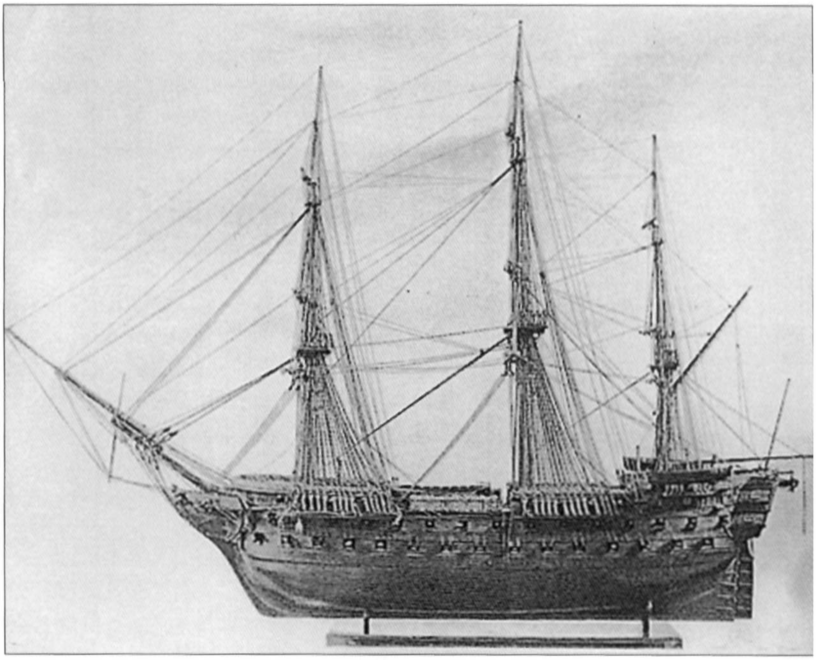
Second rates were a particularly British creation, as other navies relied on first rates, or else lengthened third rate ships-of-the-line. Like first rates, these ships were three-deckers, and carried 98 guns. They were designed as a cost-effective alternative to the larger warships, and they also acted as fleet or divisional flagships. Although relatively numerous, they proved a compromise which was not particularly successful. They developed a reputation for being poor performers under sail; their high structures meant that they were prone to losing leeway, and they were slow compared to other ships-of-the-line. What ensured their position in the fleet was the firepower they could bring to bear.

Until the late 1770s most of these vessels had 90 guns, but subsequent ships were longer (with a 175 ft gundeck), and could therefore mount more guns. A second rate such as HMS *Ocean* (launched in 1805) had a 195 ft gundeck, longer than that of the *Victory*. The difference was that the main gundeck carried 18-pdrs. rather than the 24-pdrs. mounted on the first rate. There were two main groups of second rates in service. The older ones, built before 1783, carried 12-pdrs. on their upper deck and were designed as 90-gun vessels. Two of these were later cut down ('razéed') to convert them into two-deck 74-gun ships-of-the-line. Others were con-

This View of the Royal Navy print dating from 1804 presents a visual interpretation of the rating system. It also lists the names of all the ships in the fleet.


A VIEW OF THE ROYAL NAVY
OF GREAT BRITAIN,
Dedicated by Permission to His Royal Highness The Duke of Clarence Admiral of the White
1804
1st RATE
2nd RATE
3rd RATE
4th RATE
5th RATE
6th RATE

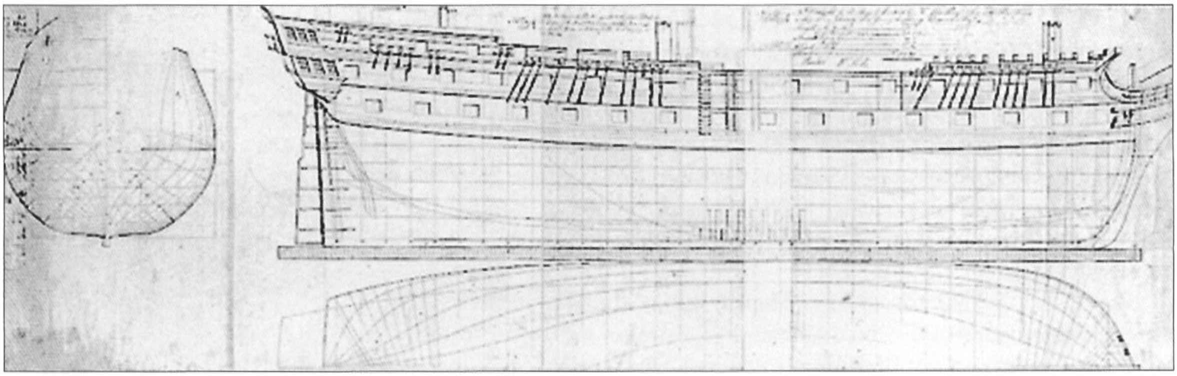
demned out of service during the period. The second, a more modern group of four warships of the Neptune class, designed by Sir John Henslow, were powerful enough to carry 18-pdrs. They were launched between 1797 and 1801, and carried 28 32-pdrs. on the lower deck, 30 18-pdrs. on the middle gundeck, 30 more on the upper gundeck and 12 12-pdrs. on the forecastle and quarterdeck. Of the 17 second rates in service at the start of the French Revolutionary War, only eight were in commission, the remainder being 'in ordinary'. A number of other new second rates such as the *Ocean*, *Boyne* or *Union* were converted into first rates while under construction.



A model of a 74-gun ship of the Surveyor's class (or Vengeur class), a series of 40 ships-of-the-line launched between 1809 and 1812. They were popularly known as 'the Forty Thieves'.

Third rates were the true bastions of the fleet, carrying between 64 and 80 guns. The most common size was the 74-gun ship-of-the-line. They all had two continuous gundecks (a main gundeck and an upper gundeck), with extra guns on the forecastle and quarterdeck. Like other navies, the Royal Navy relied on its 74s for the ideal combination of gun power and sailing abilities. The third rate became popular in the 1670s, and 60-, 70- and 80-gun ships became the main element in the line of battle. For the next 150 years, third rates were the most common form of ship-of-the-line in the Royal Navy. Their dominance ended after the Napoleonic Wars, when new methods of ship construction meant that sailing warships of 90 guns dominated the line of battle. Third rates were effectively divided into three main classes: warships of 80 guns, 74 guns and 64 guns.

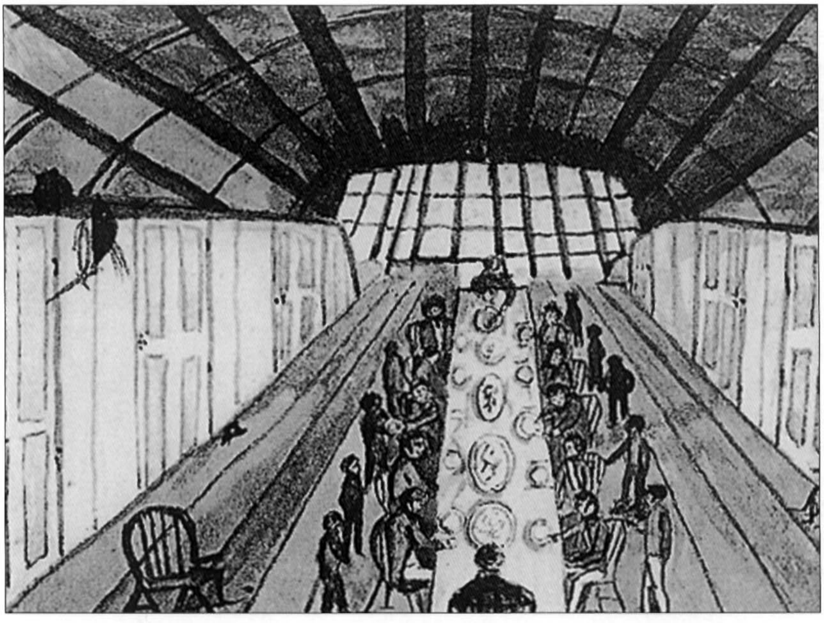
80-gun third rates were rare, and all but two of the 80-gun three-deckers built before the Seven Years War were scrapped before 1793. Of the remaining vessels, HMS *Cambridge*, was a guardship in Plymouth, but never saw service. Only two 80-gun two-deckers were in commission at the start of the French Revolutionary War, HMS *Gibraltar* which had been captured from the Spanish in 1789, and the venerable HMS *Royal William* which began life as the first rate HMS *Prince* in 1670, and was renamed in 1692. She was rebuilt again in 1719, when she was reduced to carry 84 guns. Amazingly, she was in active service for over 120 years! Two more 80-gun ships were built during the war, influenced by French designs. HMS *Caesar* (launched in 1793) proved a highly successful design, and HMS *Foudrayant* (launched in 1798) was also considered a success. In 1807 there were 12 80-84-gun ships in the fleet, most of which were captured from the French. Most of these captured vessels were also used as the basis for post-war ship designs.



Draught plans for the Ajax class, a pair of two 74-gun ships (*Ajax* and *Kent*) launched in 1798. The plan was copied from the design of the French 74-gun *Invincible*, but the hull was lengthened.

In 1747 the British captured the French 74-gun *Invincible* (built in 1744), and it has been argued that this prompted the Surveyor of the Navy, Sir Thomas Slade, to introduce his own designs for 74-gun ships. In fact, Slade's designs were based on his own improvements of existing British 70-gun ships-of-the-line. They entered service during the Seven Years War, and proved highly successful. By the 1760s the 74-gun warship was regarded as the standard ship-of-the-line, and numerous modifications to the original designs were developed, 1760–90. As a warship, it provided the ideal compromise between battery size and sailing qualities, as well as providing an economical alternative to the larger vessels that were previously in vogue.

By 1793, two basic types of 74-gun third rates were in service. Both carried a lower gundeck armament of 28 guns (32-pdrs.). The Common class carried 28 18-pdrs. on their upper deck, plus 14 9-pdrs. on the forecastle and quarterdeck. The Large class were specially strengthened to take 24-pdrs. instead of 18-pdrs. on their upper deck and also had a longer hull, with an extended gundeck on both decks. The Common class was further sub-divided into British-designed ships, with 14 upper deck ports per side, and those copied from French designs, which carried 15 ports per side (with 30 18-pdrs. on the upper deck). Sir Thomas Slade was largely responsible for the British-designed Common class ships, while the Large class was based on captured French vessels (such as the Invincible). Unlike those of the Slade era, 74-gun ships built after 1780 did not follow any design trend, apart from the general influence of French naval architecture, and the size increase of gundecks. While Slade's ships had a usual gundeck length of 168–174 ft, most of the



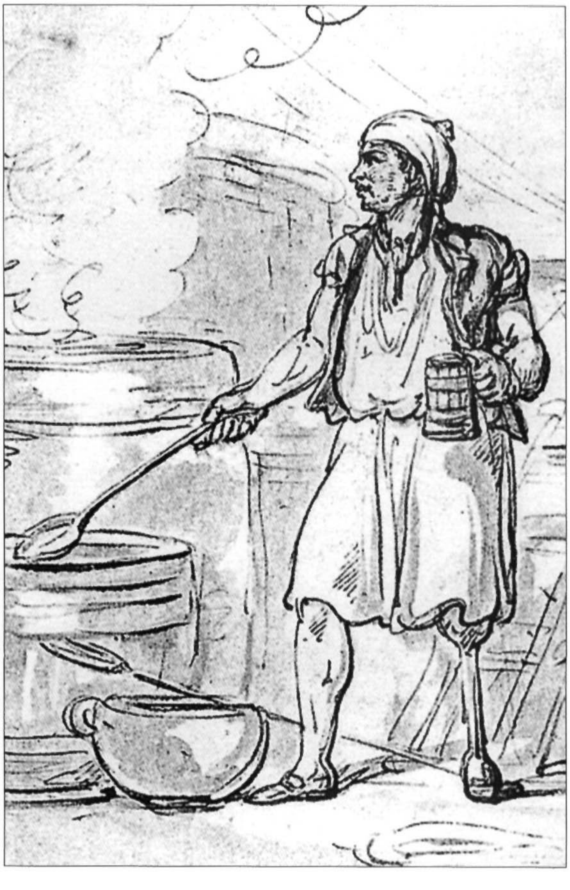
A sketch showing the wardroom of HMS *Gloucester* (74 guns), with stern windows, and officers' cabins along either wall. From the journal of Chaplain Edward Mangin, c.1812.

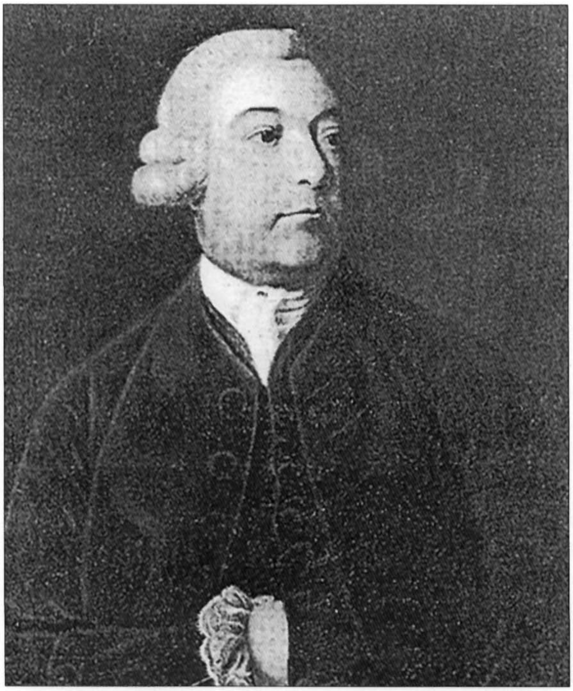
Large class (i.e. post-1780 ships) had a gundeck of up to 182ft. The Slade-designed ships were almost universally successful, but the newer and larger ships proved less so. Most had a poorer sailing performance than their predecessors, and some with lengthened hulls (with gundecks over 176 ft) were subject to 'hogging'. In 1806, the Surveyor's class (or Vengeur class) of 40 third rate 74-gun vessels was commissioned, but again, they failed to perform as well as earlier designs. Throughout the period, the best 74-gun ships in the fleet in terms of all-round performance were those designed by Thomas Slade.

In the mid-18th century, the 64-gun ship-of-the-line developed from older 60-gun ships-of-the-line, although a number were also created by reducing the armament of 70-gun warships. The standard armament of a 64-gun ship was 26 24-pdr. guns on the lower gundeck, with a similar number of 12-pdrs. on the upper deck. The remainder of the vessel's armament was made up of 9-pdrs. mounted on the forecastle and quarterdeck. The 64-gun ship-of-the-line was essentially a more cost-effective version of a larger third rate, but it lacked both the firepower and sailing qualities associated with the 74-gun ship. The last 64-gun ships were built during or immediately after the American Revolution, but by 1793 they were widely regarded as being too weak and poorly armed to take their place in a line of battle. They were still useful, however, and three 64-gun ships fought at the battle of Trafalgar in 1805. Although many of the older 64-gun ships were decommissioned as the war progressed, they were replaced by a number of captured vessels. Most of these were Dutch-built, and although excellent vessels, they were rarely used on active service. In 1796, a shortage of suitable ships led to the purchase of five large and partially completed 64-gun vessels from the East India Company. For all the criticism about the lack of firepower of the 64-gun ship, they remained a useful part of the fleet, particularly as convoy escorts.

Until the mid-18th century, fourth rates took their place in the line of battle, but the two-decker 50–60 gun ships were considered obsolete by 1793. Consequently, they were used for convoy escorts, or for detached duties overseas, far from the likely areas of conflict between battle fleets. Only one 60-gun ship was in existence in 1793 (HMS *Panther*), and although 19 of the 50-gun ships were in service, they rarely saw action. The exceptions were HMS *Adamant* and HMS *Isis*, which participated in the battle of Camperdown in 1796, and HMS *Leander*, which played an active role in the battle of the Nile a year later. HMS *Glatton* was also present at the bombardment of Copenhagen in 1801. Several fourth rates were captured from the Dutch and commissioned into service during the French Revolutionary War, while others were bought into service from the East India Company. None were used as ships-of-the-line.

A ship's cook held a warrant as a petty officer, and was not required to perform arduous duties on board, apart from basic preparation of the food, which was then issued to mess cooks. Sailors who had lost their limbs were commonly appointed as cooks. Aquatint engraving by Thomas Rowlandson. (Private Collection)





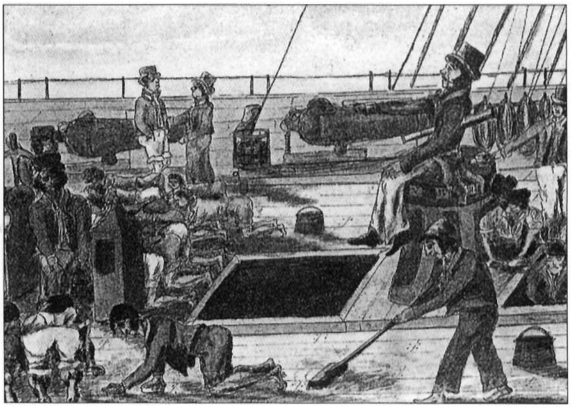
Sir Thomas Slade, who held the post of Surveyor of the Navy from 1755 until his death in 1771. He designed many of the most successful ships-of-the-line of the period, including HMS *Victory*.

OPERATION

Manning a ship-of-the-line

Officers were gentlemen, and expected to behave as such, whatever their social origins. A handful had worked their way up through the ranks (some seamen reaching the rank of admiral), but naval service usually lacked the glamour attached to service in the more fashionable army regiments. Unlike the army, where commissions could be bought, naval officers were professionals, who (almost exclusively) worked their way up through the ranks, promoted through merit. It was only among senior lieutenants and junior post captains that the support of social or service peers was helpful in securing a good position or advancement. All 'rated' warships were considered 'post ships', commanded by post captains. Once an officer was 'made post', his status was measured by seniority, and as long as enough captains above him died or retired, he would eventually be promoted to admiral. The captain was the ultimate power on board their vessel, and although the navy regulated discipline, the captain's policy towards his ship's company determined their efficiency and happiness. In other words, the effectiveness of a ship-of-the-line was determined largely by the effectiveness of its captain, however good a ship and crew he had under his command. The one levelling factor was that although some captains could be martinets and others lax, by the time they gained command of a ship-of-the-line, almost all of them were highly experienced, professional seamen.

The captain was assisted by a first lieutenant, who administered discipline and supervised the everyday running of the ship, then by a series of lesser lieutenants (second lieutenant, third lieutenant, and so on). Each lieutenant had his own responsibilities for the well-being of a division of seamen, and acting as officer of the watch when the ship was at sea. In action, each of the subordinate lieutenants took command of a section of guns (usually half of a gundeck, on both sides). All officers and midshipmen, apart from the captain and first lieutenant, were required to keep a watch. In addition, an officer of marines supervised the marine detachment. All officers from the lowliest lieutenant to the First Sea Lord were commissioned officers, holding a warrant from the Crown. Below them were the midshipmen, officers under training, who were officially rated as petty officers. These 'young gentlemen' had to serve at sea for a minimum of six years and prove they were aged over 19 before they could 'pass for lieutenant'. They underwent a rigorous examination by a board of captains who assessed their professional skills. If they passed, and a ship was available for them to serve in, they became lieutenants, whose seniority levels mirrored those of post captains. In addition, most ships carried a surgeon and sometimes a chaplain, who were allocated the status of officers. While the captain lived and dined alone, and the midshipmen were berthed in their own 'gunroom', the remainder of the officers were allocated cabins which adjoined the 'wardroom', the officers' communal lounge and dining room. Most captains and many wardrooms maintained their own larders, cooks and servants, ensuring a level of luxury and quality of fare which was far better than that enjoyed by the ship's company. The rigid social divisions that marked British society were mirrored in the navy.

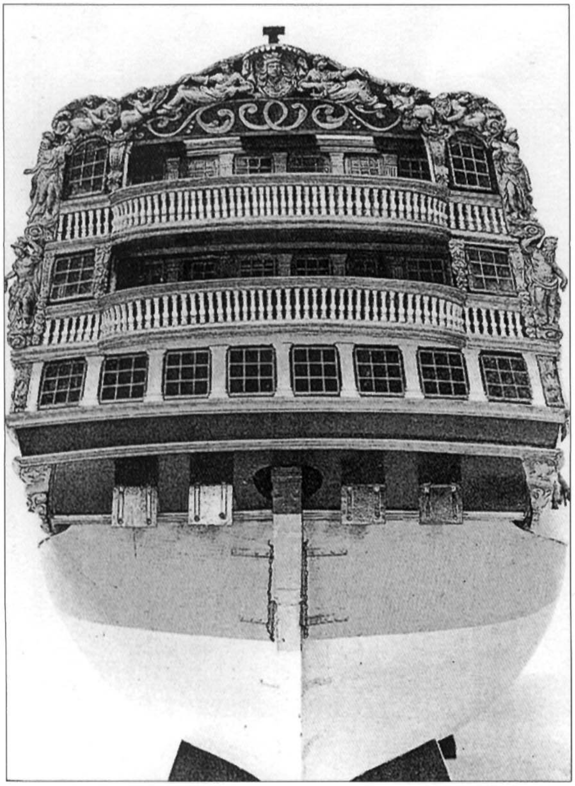


Part of the morning ritual of a ship-of-the-line was the scrubbing of her decks. Here a lieutenant supervises the working party from the main capstan. Sketch from the midshipman's journal of Frederick Marryat.

As for the sailors themselves, although their conditions were primitive and discipline could be severe, most accepted their fate, and endured their privations with a fortitude that would be difficult to find today. In 1793 there were 36,000 sailors in the navy, and 9,000 marines. During the French Revolutionary and Napoleonic Wars the navy underwent a threefold increase, reaching a maximum strength of 145,000 men in 1813. Some of these men were volunteers, either seamen seeking employment or patriots wanting to serve their country. Volunteers were awarded a bonus (£70 in 1793), but numbers were insufficient to provide more than a handful of the men the navy required to crew its ships. In 1795 a system was established where each county provided conscripts. Often, local magistrates used this as an excuse to weed criminals and 'undesirables' from their parish or county, and many felons were given the option of gaol or the navy. Although these sources of recruitment helped, the majority of recruits in the navy were pressed men. In 1793 all British seamen between 18 and 55 were liable for impressment unless they held an exemption certificate or were ranked as mates or above in the merchant service. As pay and conditions were worse in the navy than elsewhere, sailors tried to avoid naval service, forcing the navy to resort to more aggressive methods in order to man their ships. The Impress Service was formed in 1793, which operated permanent press gangs in over 50 British and Irish ports. In addition, individual ships short of manpower often sent their own press gangs into ports. Once pressed, sailors (or landsmen if caught up in the net) were given the opportunity to 'volunteer'. Once caught, there was little chance of escape. Volunteers, conscripts and pressed men were all taken to receiving ships; heavily guarded 'hulked' ships-of-the-line moored off the royal dockyards. From there, men were allocated to ships.

Once on board a man-of-war, British sailors had no entitlement to shore leave, and served for the duration of the ship's commission. Sailors belonged to a ship, not to the service, and over years of service together, a crew would often become a highly trained and integrated team, who knew their ship, its officers and the limitations of both. In many cases, when a warship was decommissioned, crew could be sent straight to a new one, without setting foot on shore. This could continue for the duration of the war. Leave in a home port was considered a luxury, granted only to the most trusted men. On overseas stations, the majority of the ship's company were allowed to go ashore, as desertion was considered less of a risk. If men deserted, they were sought out, and if caught (at any time in the future) they were flogged and returned to duty.

Recruits were given a rating, which was recorded in the ship's muster book. These ratings stretched from boy (classed by age), landsmen, ordinary seamen, and able seamen. Progress up the rating ladder was achieved through the development of nautical skills, and the higher the rating, the better the level of pay. In addition, skilled able seamen could be promoted to petty officers, who held numerous specialist titles on board, including boatswain's mate, coxswain, master-at-arms, ship's cook, gunner, captain of the top and sailmaker. The crew were further divided by a system of shipboard organisation that allocated sailors to specific tasks and watches.



The stern decoration of HMS *Boyne*, a second rate of 98 guns, showing positions for stern chase guns on the lower gundeck, with the admiral's stern quarters windows and gallery above that, and the captain's quarters on the uppermost deck. (Science Museum, London)

Shipboard organisation

Between 1793–1815 ships-of-the-line were allocated a crew of between 650 and 875 men, although, sickness, desertion and a lack of available seamen meant that most never achieved their full complement. First rates were allocated 875 men, second rates 750 men and third rates 650 men. In addition, one marine was allocated for each gun on a ship-of-the-line, and a marine captain and two subalterns commanded the marine contingent.

The organisation of these men, their daily routine and the conditions in which they lived were all regulated. Ship's companies often remained together for years, and often remained at sea for extensive periods. The welfare of the crew was therefore an important consideration for the captain and his officers. Contrary to popular belief, martinet captains were a rarity, and although conditions were harsh, most cared for their men, and tried to make their conditions as bearable as possible.

The first lieutenant divided the ship's company into 'watches', usually two (sometimes known as larboard and starboard). When a watch was called on deck, it therefore involved half of the ship's company at a time. Some captains introduced a three-watch system, as it was rare to need so many men to serve the ship at any one time, except in severe weather. It was sometimes used as a reward for a crew in certain circumstances, and ships could change from one watch bill to the other as circumstances demanded. A four-watch system was frequently adopted in harbour. Others felt that the three-watch system encouraged laziness and that if any unforeseen mishap occurred, there would be insufficient men available to see to the safety of the ship. Throughout the period, most ships-of-the-line maintained a two-watch system, where the crew was divided into two equal parts. During daylight hours, both watches were on deck at the same time, and when extreme circumstances demanded, the call of 'all hands on deck' meant that the entire ship's company was available to service the ship. Between 7–10 percent of a ship's company (55 men on a third rate) were labelled as 'idlers', and were not required to stand watches. Instead, they remained on duty during daylight, when they usually performed specific duties within the ship. They were required to help out when 'all hands' were called. Idlers included skilled artisans such as sailmakers, carpenters, butchers, livestock handlers, gunner's mates, boatswain's mates and officers' servants. A ship-of-the-line was a complex and crowded environment, where each man had his place, and whose life was regulated according to his watch bill, rating, part of ship, station and quarter.

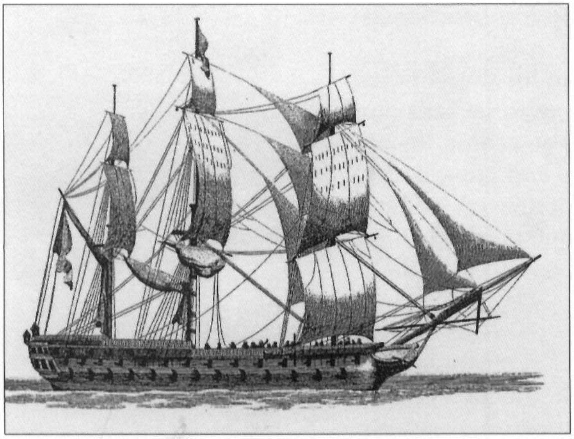
Captain Thomas Freemantle commanded the second rate HMS *Neptune* (98 guns) during the battle of Trafalgar. His ship followed behind Nelson's Victory, and forced the surrender of the massive Spanish first rate *Santissima Trinidad*, the largest ship on either side in the engagement. (Private Collection)

Each watch was further sub-divided into six 'parts of ship'. This determined where each member of the crew worked while he was on watch. For example, each mast had 'topmen' allocated to it, usually the best of the seamen on board. On a typical 74-gun ship, there were 25 topmen allocated to serve in the foremast, 27 in the mainmast and 15 in the mizzen mast. Each group was commanded by a 'captain of the top', rated as a petty officer. 'Forecastle men' usually worked the anchors and bowsprit, while the 'afterguard' served on the quarterdeck. The least experienced seamen were placed in the 'waisters' (about 30 per watch), who performed mundane tasks such as cleaning the ship or moving stores.

In addition, each seaman was allocated a 'station' for a particular manoeuvre during tasks such as anchoring, tacking or wearing ship. This was usually achieved by allotting a group of men from within the 'part of ship' of a watch to a particular task. These tasks took a surprising number of men. For example, when unmooring a first rate, 30 men were stationed on the forecastle, 70 in the cable tier and 60 in the veering tier. In addition, 60 worked the messenger, while 20 more acted as nipper men. 15 men operated the fish tackle, 124 men turned the capstan, and 4 men ensured the cable passed smoothly down into the cable tiers. This operation therefore required 383 men, leaving the rest of the ship's company to operate the sails. Everyone knew what job they were required to perform, and where they should be for each specific nautical evolution.

When a ship went into action, all hands were called 'to quarters'. Most of the crew (about 75 percent) were allocated to serve the guns, while the remainder operated the sails. Each pair of guns (one on either side of the ship) had an allocated crew (i.e. 14 men to a 32-pdr.), which meant it was impossible to fire both guns at once with a full crew. The numbers were based on the minimum number of men needed to operate the gun (in this case 7 men), but to fire quickly and efficiently all 14 crewmen were needed. If the ship had to fire both sides as once, the crew were split, with minimum crews serving each gun. In addition to serving their gun, many of these men had additional duties. For example, of the 14 men allocated to a 32-pdr., two could be called away to form a boarding party when ordered, two more acted as sail trimmers, two would man the pumps if the ship was taking on water, and one man formed a fire fighting party if required. If all these were called away, the gun was left with its minimal crew of 7 men.

Marines sometimes operated their own allocated guns, while others acted as sharpshooters, stationed in the fighting tops or on the



A 74-gun third rate wearing (turning the ship through the wind), with her foresails braced round to provide the power to let the ship fall off away from the wind. From D. & J. T. Serre's *Liber Nauticus* (London, 1805). (Author's Collection)

quarterdeck. The remainder of the ship's company were stationed elsewhere in the ship. Some were in the masts and fighting tops, where they worked the sails, or were issued with muskets. Others served in the magazines, filling cartridges and ensuring a steady supply of ammunition was passed up to the gundecks. The carpenter and his assistants were stationed down in the orlop deck, where they were on hand to plug any shot holes in the ship's side. Officers were allocated to the gundecks, while the captain, first lieutenant and master stood on the quarterdeck, issuing orders as required, which were relayed by midshipmen. In theory, the organisation of the ship-of-the-line was designed to take account of every possible eventuality; each man knew where he had to be at any particular time, and understood the duties he was required to perform.

Sailing a ship-of-the-line

Seamanship and the handling of a large sailing ship was a complex business, but both a first rate and a small sloop operated on the same basic principles. Ships-of-the-line could use the wind to sail in any direction they wanted, apart from directly into the wind, or about 60° on either side of it. The speed of sailing depended on the number of sails set, and the angle of the wind upon them. The best point of sailing was usually when the wind came over the stern quarter of the ship. Unless the ship was sailing with the wind directly behind it, the ship was propelled in the direction it wanted to go, but was also blown slightly off course (known as 'making leeway'). The helmsman had to constantly compensate for this tendency.

Wind hit the sails, which resisted the force, creating energy, which was concentrated forward of the mainmast (a point known as the 'centre of effort'). The angle of the sails to the wind concentrated or dissipated this 'effort', creating momentum, which pushed the ship through the water. In other words, the sails had to be angled to take advantage of the wind direction in relation to the heading of the ship. Sails could also be trimmed to create less resistance, or extra sails could be set (such as 'studdingsails' and 'royals').

Although a ship could not sail into the wind, when sailing close (i.e. 60–90° on either side of the wind direction), the ship was deemed to be sailing 'close-hauled', or 'on a bowline'. With the wind coming from over the beam (called 'sailing by'), momentum was greater, but the best angle of all for momentum was when the ship was 10–20° off the direction of the wind, so it came over the stern quarter of the vessel (called 'sailing large'). Sailing with the wind directly behind the vessel was deemed as sailing 'before the wind'. If a ship headed directly into the wind it would stop, or even get blown astern.

A ship could turn through the wind by 'tacking', turning the ship so the wind originally coming over the starboard bow would blow over the port bow instead). This placed strain on the masts and rigging, so many captains preferred 'wearing', which involved turning away from the wind, then continuing to turn (effectively tacking 'the long way round').

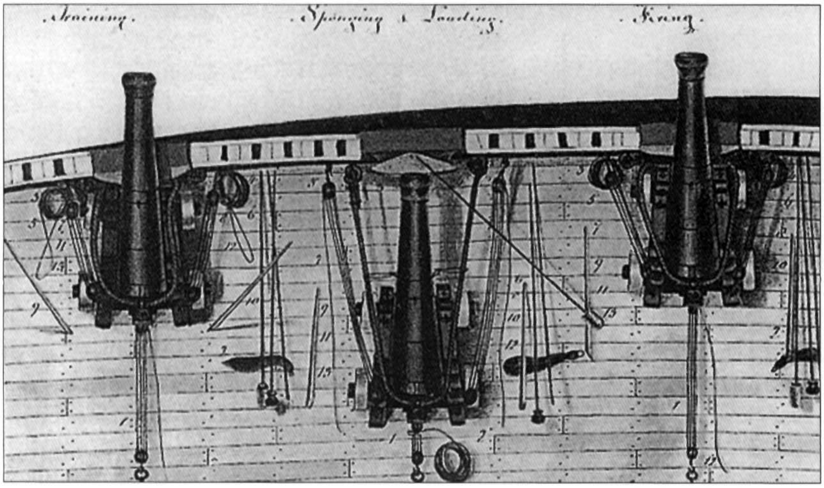
The effect was the same, but it was slower and the ship lost headway as she performed the manoeuvre.

The risk to spars and yards was a particular problem for ships-of-the-line on blockade, when it could take months for spares to be sent out from Britain. Some warships stayed at sea for years at a time, in all weathers. Although this placed a great strain on ships and crew, it also meant that British sailors were probably the most experienced seamen in the world, and captains fully understood the limitations of their command. This proved a great advantage when they had to lead their ship into battle.

The ship-of-the-line in action

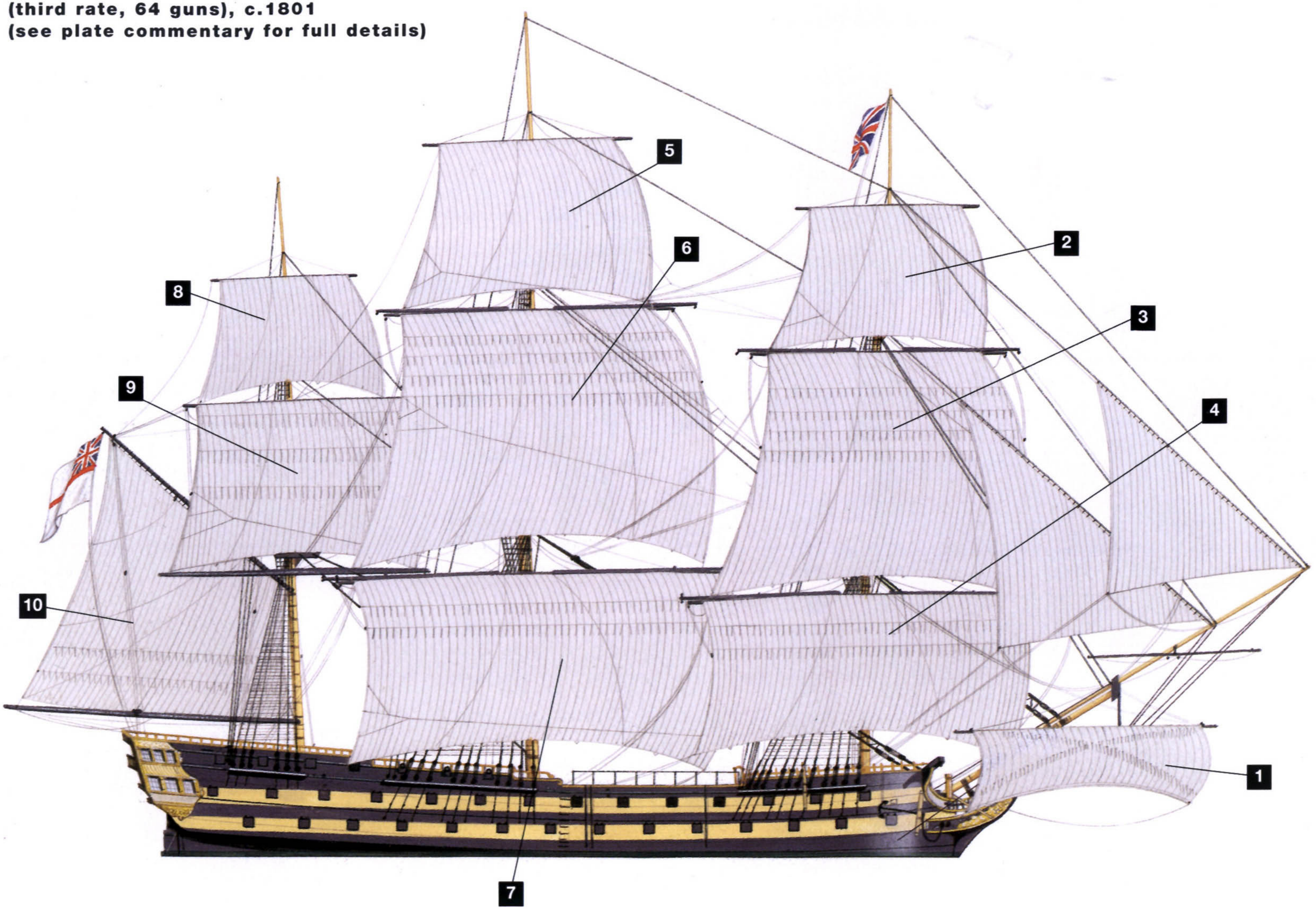
During this period, all naval guns were classified by the size of the ball (roundshot) they fired. The largest guns were Armstrong pattern 42-pdrs., which were only found on the lower gundecks of the older first rates. As the war progressed, more reliable 32-pdrs replaced them. The 32-pdr. (9 ft 6 in long, weighing 55 hundredweight) was the principal armament of the British ship-of-the-line, fitted in all vessels apart from 64-gun vessels. These smaller ships-of-the-line carried 24-pdrs. (9 ft long, weighing 47 hundredweight) on the lower gundeck, and they were also mounted on the middle gundeck of first rates. The 18-pdr. was used on the upper deck on most third rates, and on the middle gundeck on second rates. 12-pdrs. (9 ft long, weighing 34 hundredweight) were carried as upper deck guns on first rates and second rates, while 9-pdrs. (9 ft long, weighing 31 hundredweight) were mounted on the quarterdeck and forecastle of first and third rate ships. These guns were designed to patterns established by the Board of Ordnance based in Woolwich. While earlier guns followed the 'Armstrong Pattern', after 1786, naval ordnance was designed by Thomas Blomefield, whose name was given to a lighter pattern of long gun. By 1793, Blomefield pattern guns were the standard armament in British ships-of-the-line.

The carronade was invented in the late 1770s by the Carron Ironworks in Falkirk, in Scotland. It was a short gun with a relatively large bore, which meant it had a short range, but could fire a far larger ball than a long gun of similar weight. In 1794 an establishment



A trio of 12-pdr. long guns mounted on the upper gundeck of a first rate or second rate ship-of-the-line, viewed from above. The illustration clearly shows the arrangement of breeching ropes and pulleys used to move the guns.

A: HMS *Agamemnon*
(third rate, 64 guns), c.1801
(see plate commentary for full details)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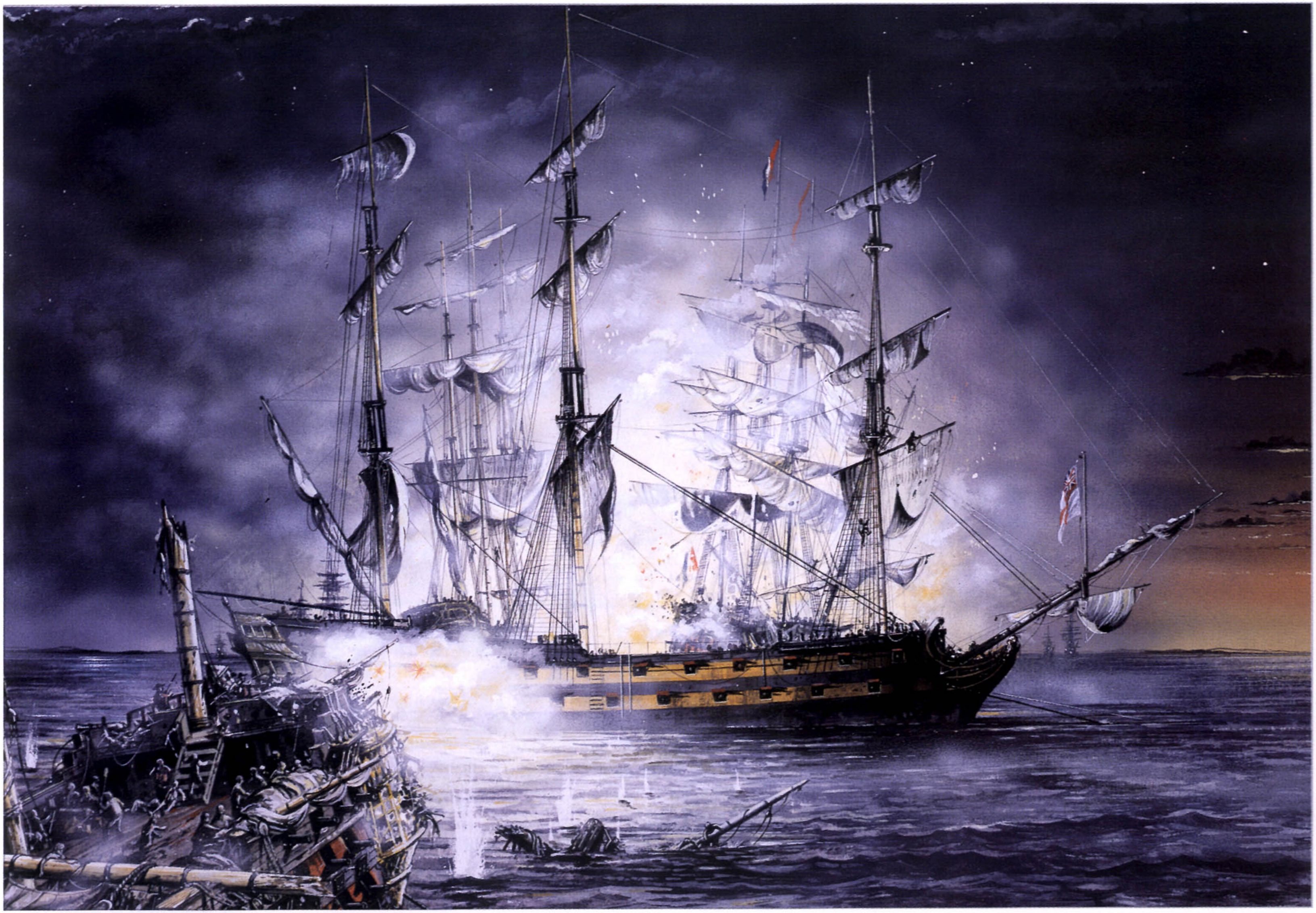
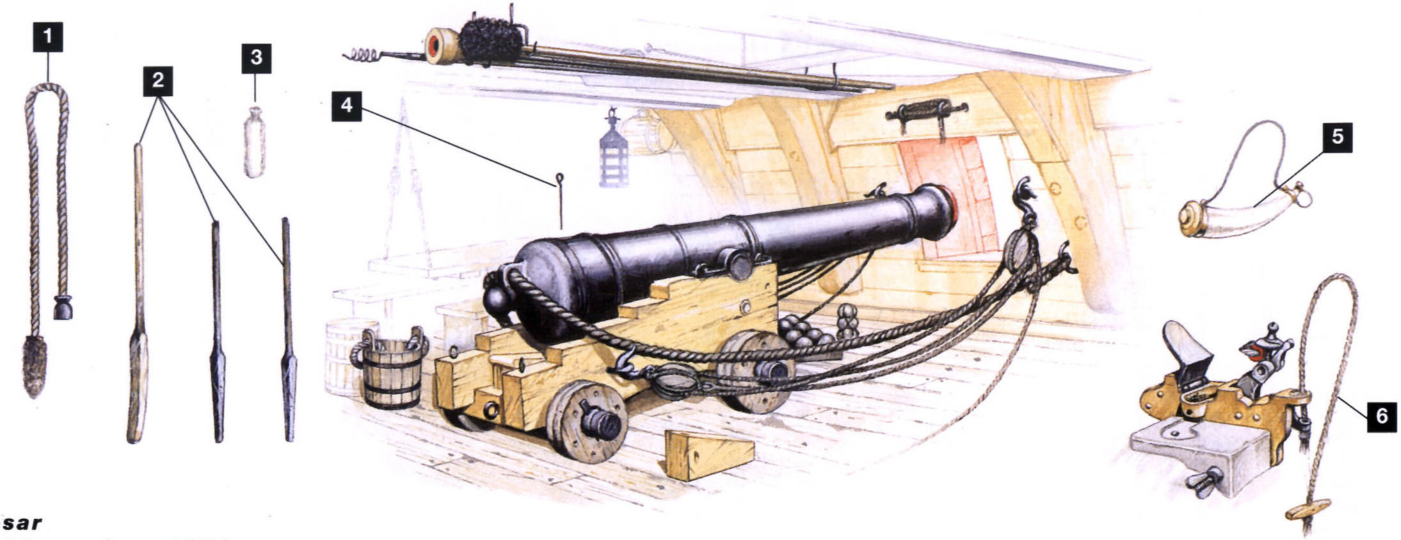
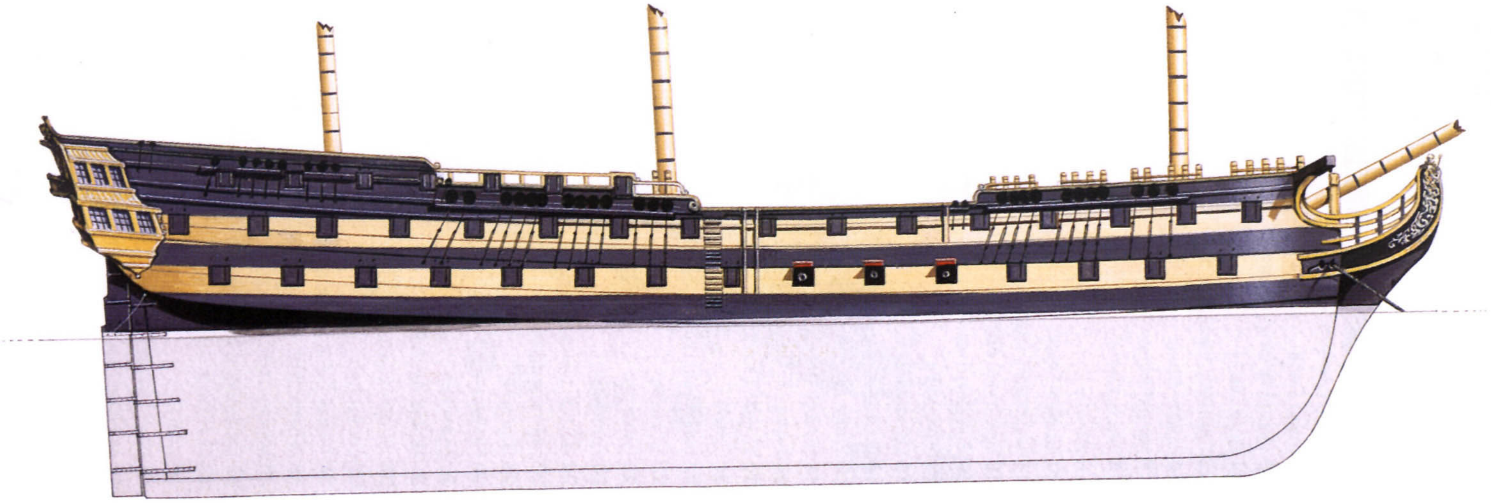


B: HMS *Leander* (fourth rate, 50 guns) at the battle of the Nile, 1798



C: HMS *Caesar*
(third rate, 80 guns), c. 1801
(see plate commentary for full details)



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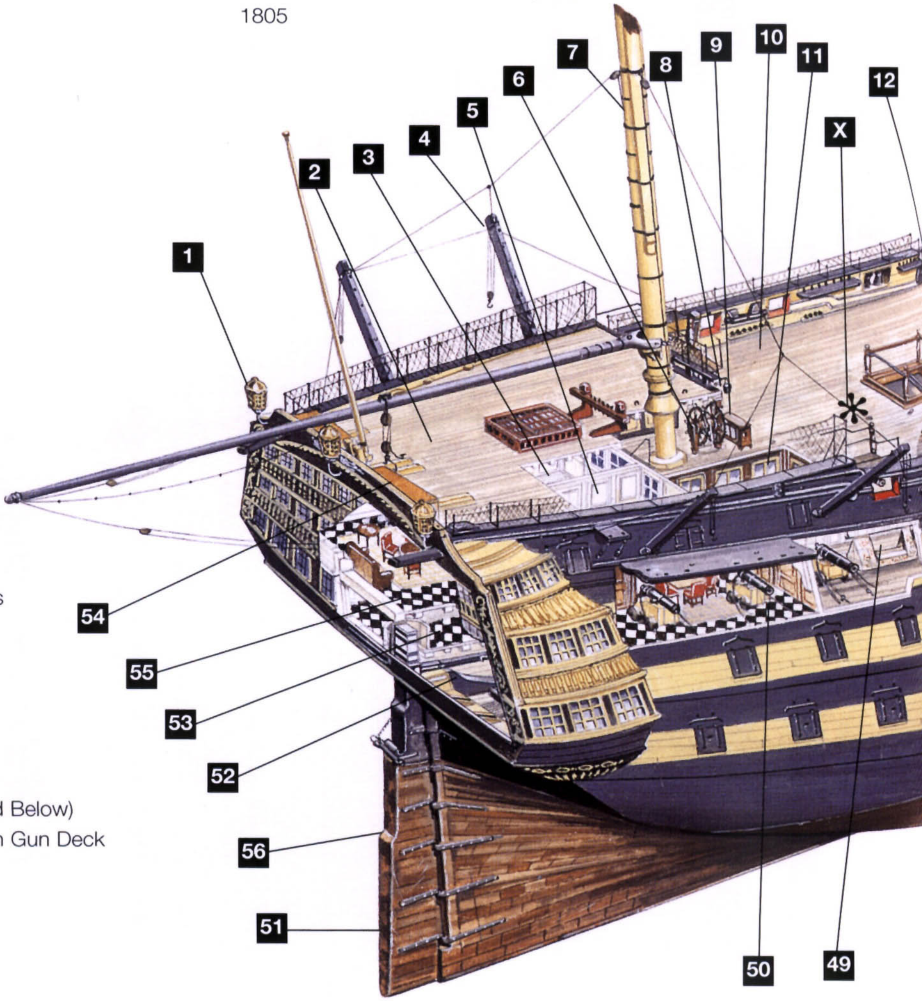
D: HMS *VICTORY* (FIRST RATE, 100 GUNS), C. 1805

KEY

1 Stern Lanterns
2 Poop Deck
3 Captain's Dining Cabin
4 Boat Davits
5 Captain's Sleeping Cabin
6 Ship's Wheel
7 Mizzen Mast
8 Fire Buckets
9 Binacle
10 Quarter Deck
11 Secretary's Cabin
12 Hammock Netting
13 Port Elm-Tree Pump
14 Main Mast
15 Upper Deck
16 Fore Jeer Capstan
17 Sheer Anchor
18 Boat Supports
19 Belfry
20 12-pdr. Guns
21 Galley
22 Fire Hearth and Boiler
23 Chimney
24 Foremast
25 Forecastle
26 68-pdr. Carronade
27 Marine's Walk
28 Bowsprit
29 Figurehead
30 Gunroom
31 Bower Anchor
32 24-pdr. Guns
33 Cable Tiers
34 Typical Deck Support Timbers
35 Riding Bitts
36 Middle Deck
37 Carpenter's Store Room
38 Gun Deck
39 Keel
40 Main Magazine
41 Hanging Magazine (Main Hold Below)
42 Gun Ports to 32-pdr. Guns on Gun Deck
43 Entry Port
44 Shot Garlands
45 Chain Pump
46 Starboard Elm-Tree Pump
47 Orlop Deck
48 After Hold (including Store Rooms, Powder Room and Ship Stores)
49 Admiral's Sleeping Quarters
50 Admiral's Dining Cabin
51 Rudder
52 Tiller
53 Ward Room
54 Flag Lockers
55 Admiral's Day Cabin
56 Copper Bottom

x = Spot where Nelson was mortally wounded at the Battle of Trafalgar, 1805



SPECIFICATION

Launched: 7 May 1765

Displacement: 2,142 tons

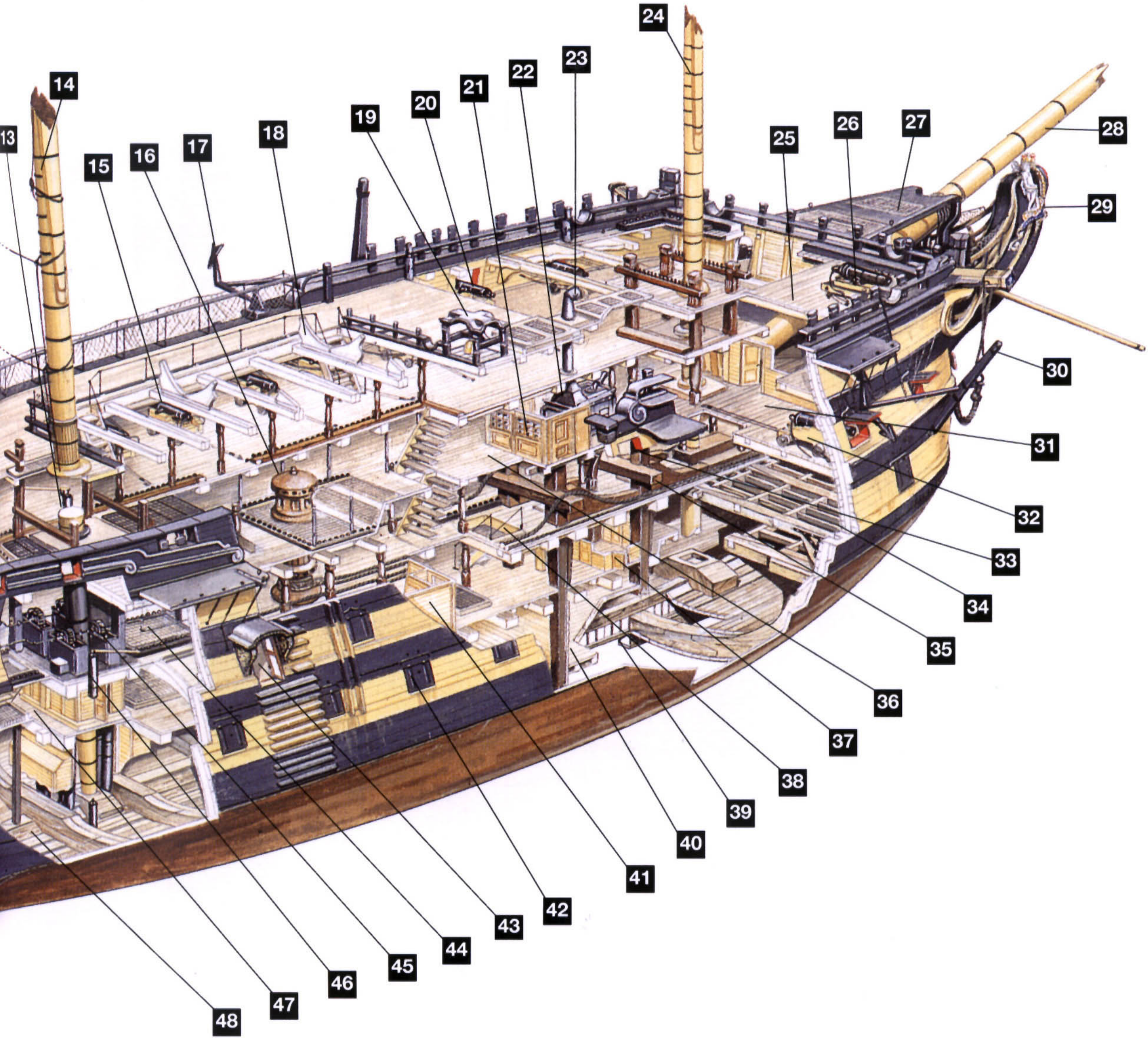
Length overall: 186 ft

Keel length: 151 ft 4 in

Beam: 52 ft

Draught: 21 ft 6 in

Armament: 30 x 32-pdrs., 28 x 24-pdrs.,
30 x 12-pdrs., 12 x 6-pdrs.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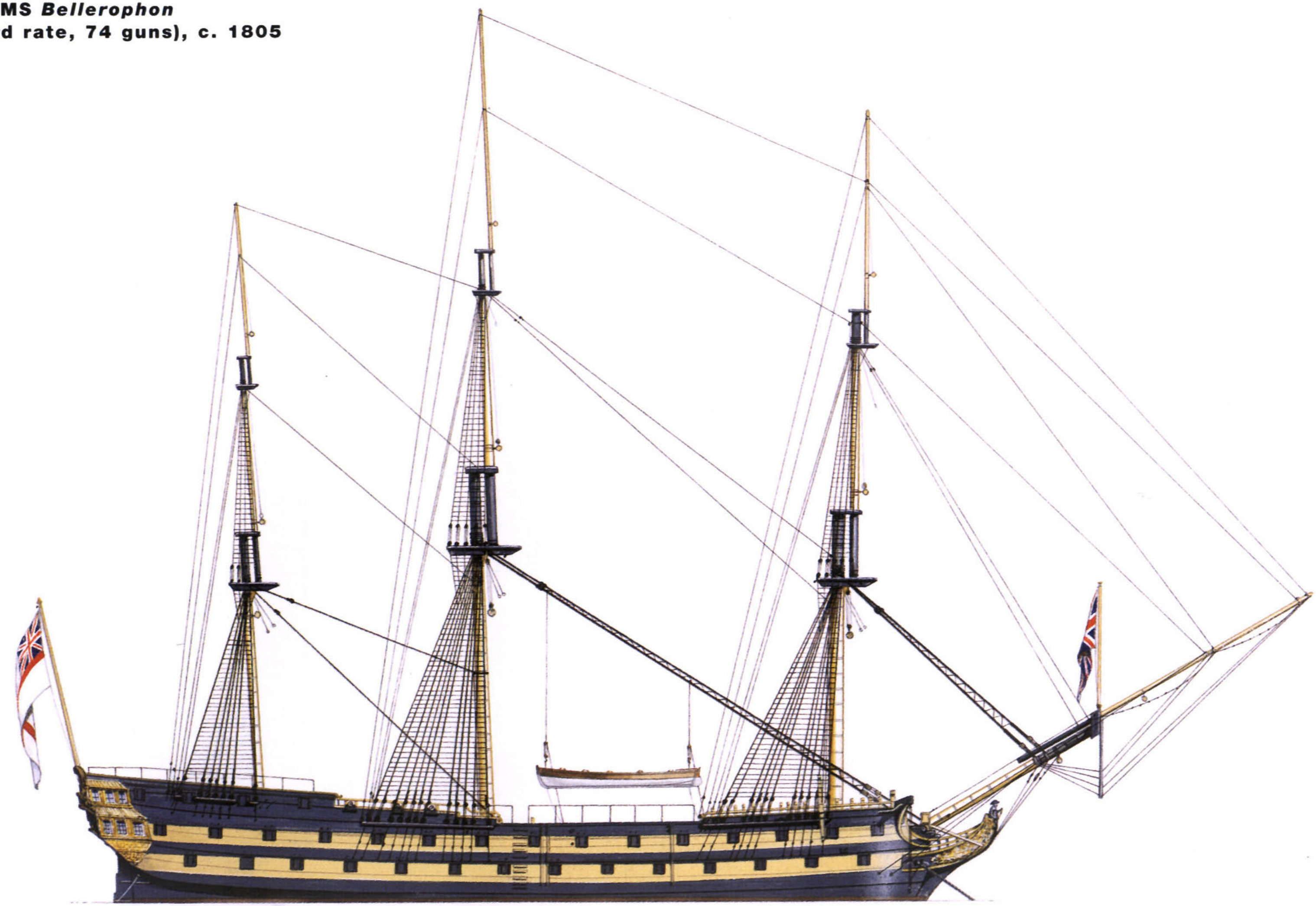
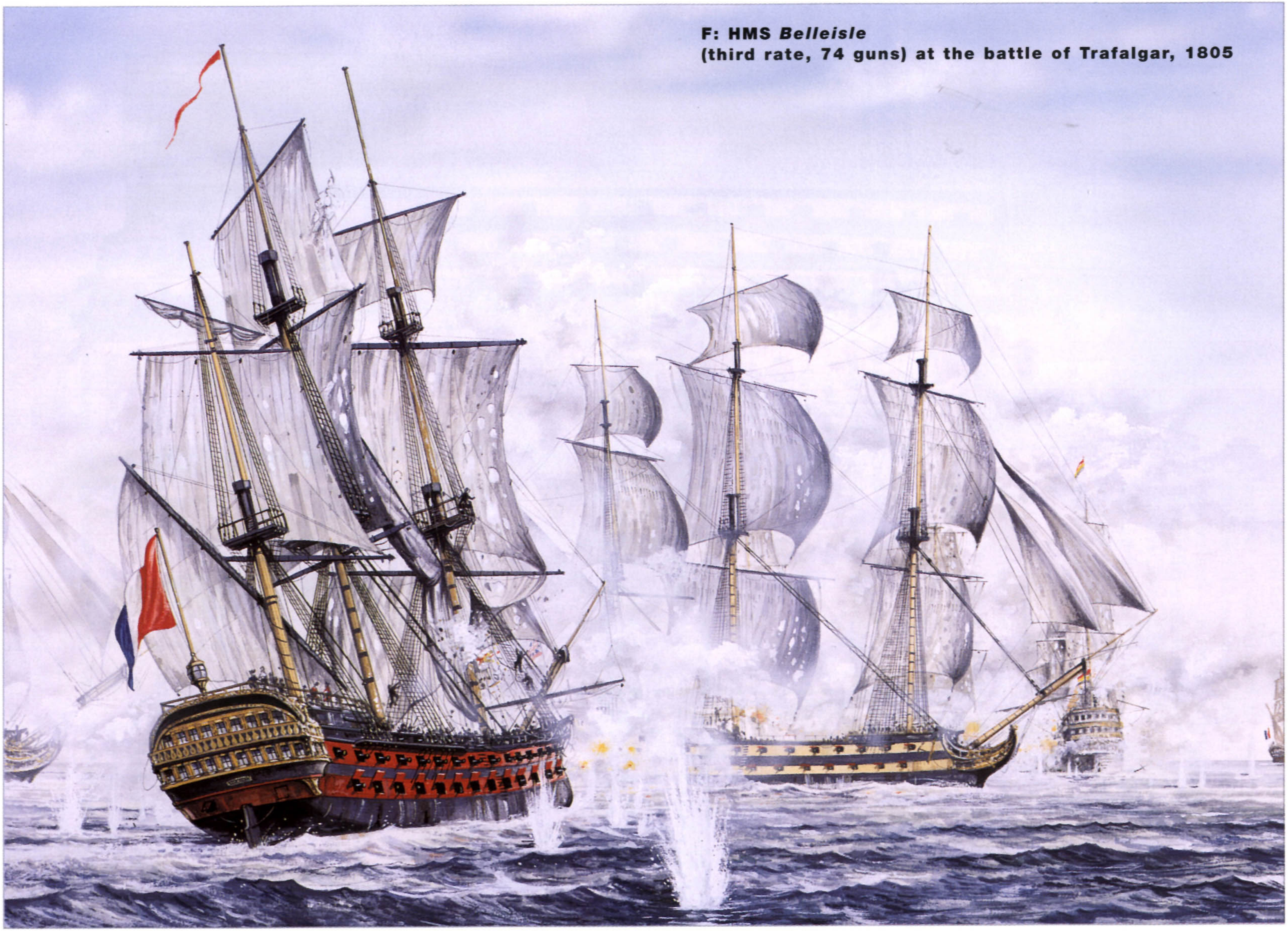
E: HMS *Bellerophon*
(third rate, 74 guns), c. 1805





F: HMS *Belleisle*
(third rate, 74 guns) at the battle of Trafalgar, 1805

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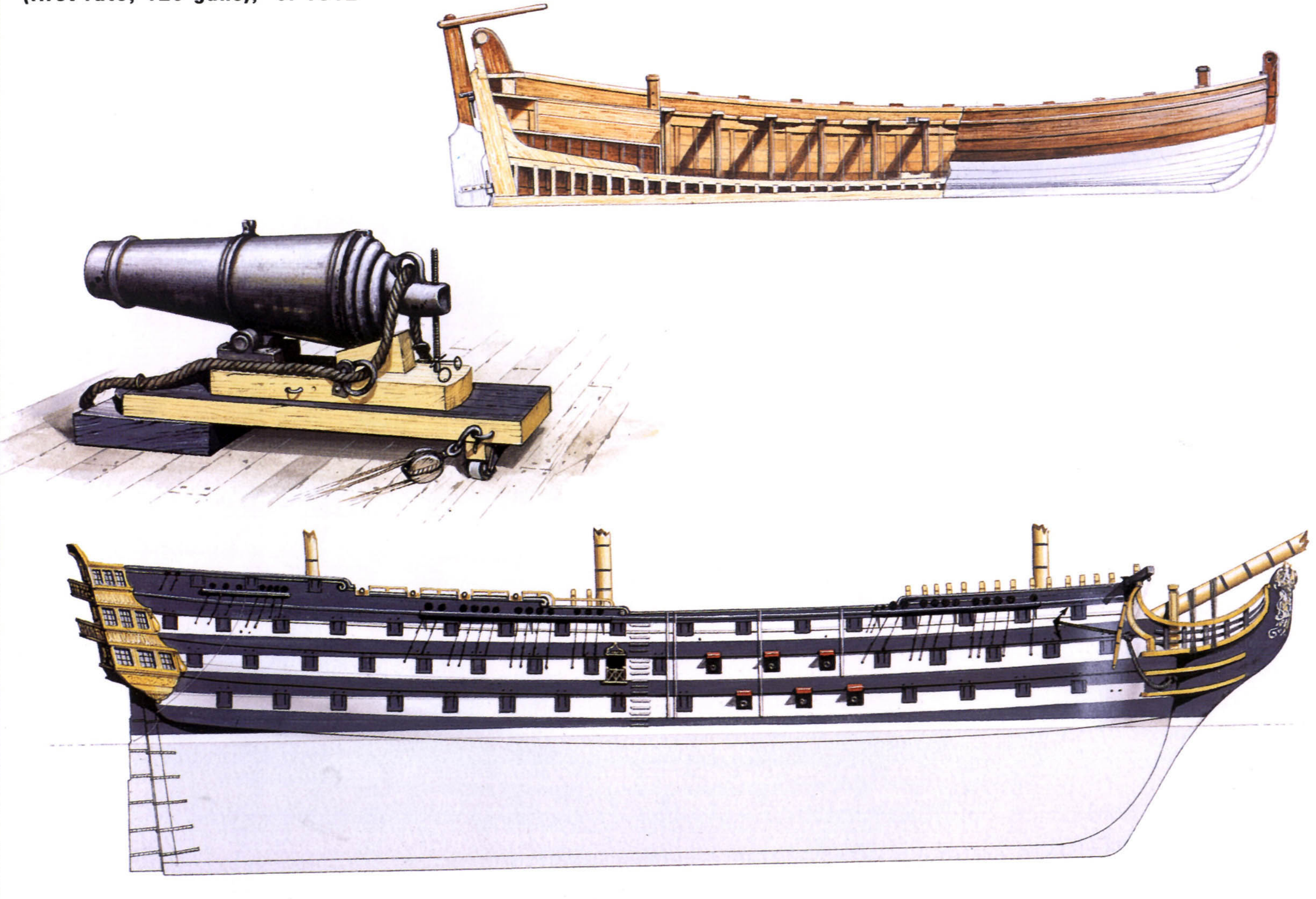
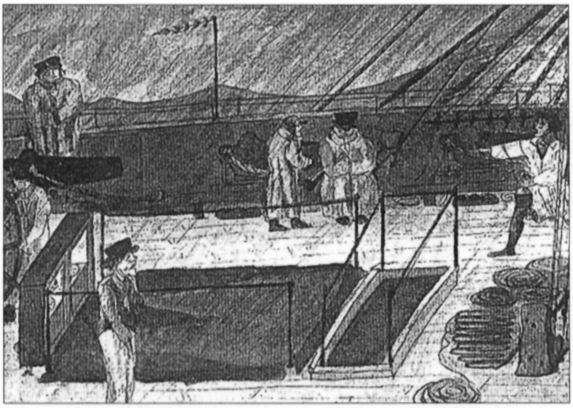
G: HMS *Caledonia* (first rate, 120 guns), c. 1812





A British man-of-war in a storm during the Napoleonic War. A sketch from the midshipman's journal of Frederick Marryat.

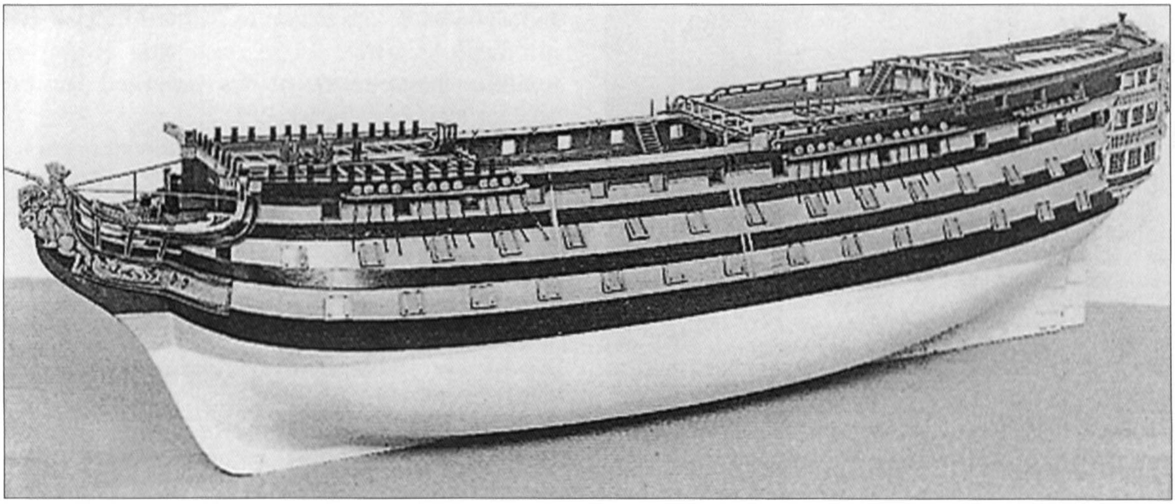
(allocation list) was drawn up, allocating a certain number of carronades to each type of ship-of-the-line. These were always mounted on the quarterdeck and forecastles, and often some of the smaller guns were removed to make room for these 'ship-smashers'. The established carronade allocation was rarely followed, and some ships carried far fewer than allowed, as their captains preferred the range provided by their long guns. In contrast, the *Victory* carried two massive 64-pdr. carronades, which exceeded anything provided on the regular carronade establishment. While earlier carronades had trunnions (like long guns) by 1793, they were mounted on a ring cast beneath the rear of the gun barrel, and a ring-breech, which was fitted to house an elevating screw. For their power, these guns were surprisingly light, and even the 64-pdr. carronades mounted on HMS *Victory* only weighed 36 hundredweight each, roughly the same as a conventional 12-pdr.

An officer supervised each group of guns on a gundeck, and each gun was overseen by a gun captain. A lieutenant was responsible for half a gundeck (about 13 guns a side) and midshipmen assisted him by supervising groups of three to five guns per side within his 'division'. A 32-pdr. had a crew of 14 men, a 24-pdr. 12 men, and an 18-pdr. was crewed by 11 men. 12-pdrs. and 9-pdrs. had crews of eight and six men respectively. Each member of the crew was allotted specific tasks.

TYPICAL ORDNANCE ESTABLISHMENT, 1793

		"First rate"	"Second rate"	"Third rate"		
		100-guns	98-guns	80-guns	74-guns	64-guns
Long Guns	42-pdrs.	28				
	32-pdrs.		28	26	28	
	24-pdrs.	28				26
	18-pdrs.		30	26	28	26
	12-pdrs.	30	40			
	9-pdrs.	18		24	18	12
Carronades	32-pdrs.	2	2	2	2	
	24-pdrs.	6				2
	18-pdrs.		6	6	6	6

First, the gun was unlashed, then loaded. Three main types of shot were used: roundshot (the principal projectile), bar-shot (or double-headed, or chain-shot), which was designed to cut down rigging, and grape shot (canisters of 3-pdr. balls or musket balls), which was a close-range anti-personnel projectile. Although roundshot had a theoretical range of over 2,000 yards, in order to pierce the hull of an enemy ship-of-the-line, the target had to be within 500 yards. Gunpowder cartridges came in bags, each containing a pre-measured charge. Once loaded the gun captain primed the vent by pricking it with a wire. This pierced the cloth cartridge. A gunlock was mounted over the touch-hole, a device resembling the flintlock mechanism of a musket, but designed to ignite a goose quill filled

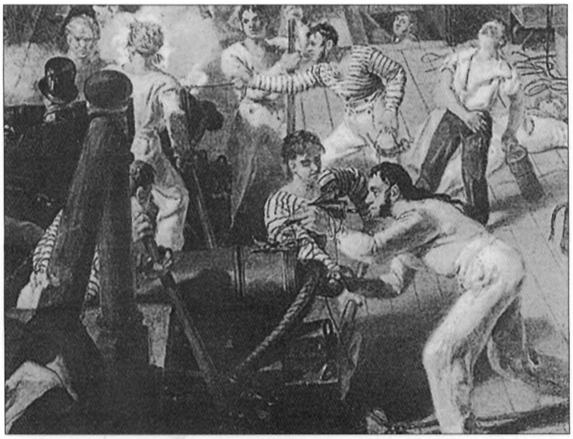


Ship model of HMS *Boyne*, one of a class of two 98-gun second rate ships-of-the-line designed by Sir Edward Hunt. The *Boyne* was launched in 1790, and was longer than any second rate previously built in Britain. (Science Museum, London)

with powder, which was placed in the vent. The gun was then run up to the gunport and aimed (if necessary). A lanyard attached to the gunlock was pulled to fire the gun. The recoil of the gun drove the gun back to the furthest extent of its breeching rope, which prevented the gun hurtling further across the gundeck. Spongers 'swabbed out' the gun using flexible spongers and rammers, then the gun was reloaded and run out again. A well-trained crew could fire five rounds every three minutes.

The reason a ship-of-the-line existed was to fire a broadside of shot at an enemy ship. Surprisingly, live gunnery practice was often given a low priority by ship captains, as gunpowder was a precious commodity supplied to ships with incredible parsimony. In effect, the navy believed that powder should be used in action, but could not be spared for drill, although wealthy captains solved this problem by buying in their own stocks of gunpowder to supplement their ship's supply. The result was that gunnery standards were usually low, and although crews could operate their guns efficiently, they had little experience of accurately aiming and firing at moving targets. In most large fleet actions, the two sides closed to a range where it was almost impossible to miss. In addition, British crews who had lived and trained together for years could usually operate their guns faster than their French or Spanish opponents, which meant that they fired more shots at the enemy than they received. The established ratio was three shots for every two fired against them. It was training in gun operation and ship handling rather than accuracy in gunnery that provided the Royal Navy with its string of victories during the period. Commanders such as Nelson realised this deficiency, and devised tactics that would lead to a short-range gunnery duel as quickly as possible. His dictum, that a captain could not do wrong if he placed his ship alongside that of the enemy, was the ultimate development of this close-range gunnery tactic. The weakness of the system was demonstrated during the War of 1812 (1812–15), when American frigates fired just as fast, and with greater accuracy than their British counterparts.

A ship usually began preparing for action an hour before hostilities began. The galley fire was extinguished, and good captains ensured their men were fed and issued with their rum ration. The ship was cleared for action, and all bulk-heads, animals and personal possessions were stowed



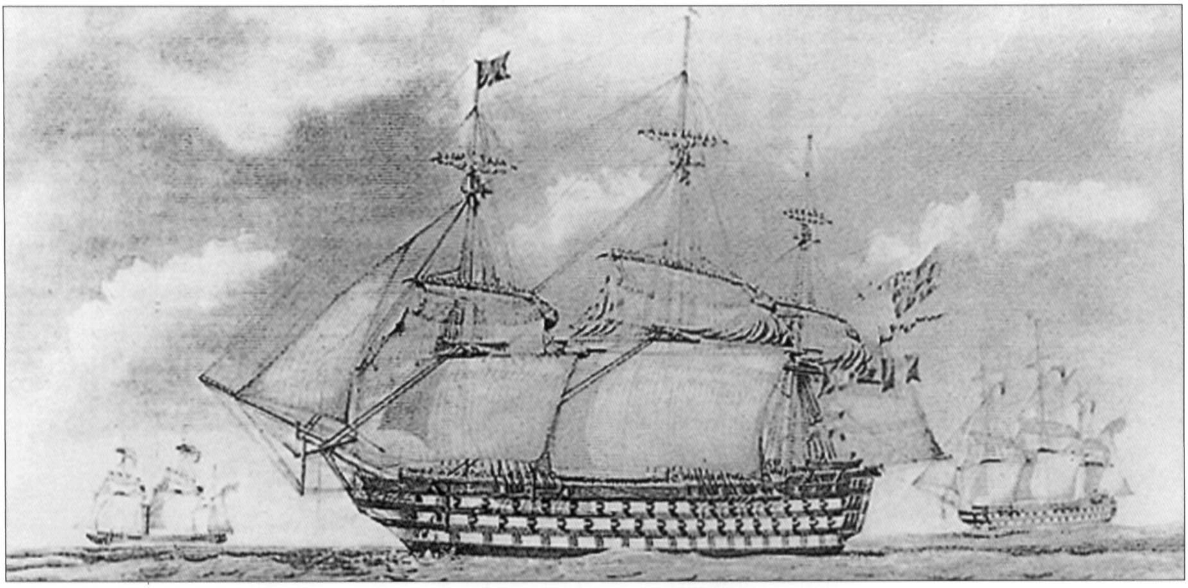
A gun captain priming his gun, while in the background another gun captain fires his piece by pulling on a lanyard, detail from *'The Battle of Trafalgar, 21st October 1805: fall of Nelson'*, by Denis Dighton.

in the hold. This created a series of continuous gundecks stretching the length of the ship. Boats were lowered and towed astern, and splinter nets were rigged above the upper decks to offer some protection from falling rigging. The decks were sanded to provide extra traction, and most officers changed into their best clothing. The magazines were screened by dampened blankets, and fire-fighting buckets and pumps were filled and readied for use. Powder and shot were brought up to each gun, and the gunner and his mates readied a further supply of cartridges and shot. Meanwhile, the surgeon and his assistants set up their surgery in the cockpit of the ship, usually using the midshipman's 'gunroom' for an operating theatre. Once all these preparations were completed, the captain gave the order to beat 'to quarters'. All hands ran to their appointed positions at their guns or elsewhere, and prepared the guns for action.

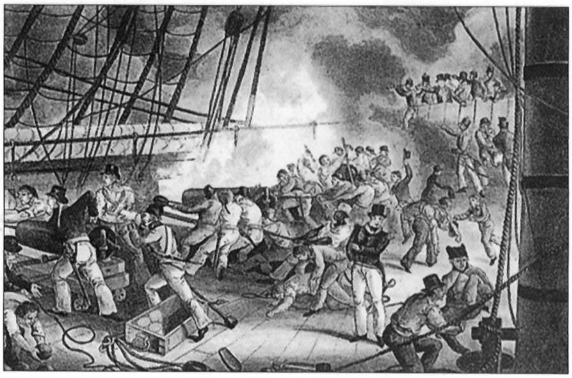
Ships-of-the-line were designed to fire their guns in broadsides (unless their hulls were too weak to stand the shock of a massed discharge), but after the first shot, guns were usually allowed to fire at will, which meant as fast as they could be reloaded. Within minutes, the gundecks were filled with smoke, and probably ravaged by enemy roundshot smashing through the hull, crushing men, overturning guns and sending showers of deadly splinters flying. At point-blank range, upper decks were swept by grapeshot, while sharpshooters tried to pick off officers and gun captains. The hellish nature of service aboard a ship-of-the-line in action can hardly be imagined.

Crews were trained to fight in boarding actions, although these were rare in major fleet engagements. A notable exception was the battle of Cape St Vincent in 1797, when Nelson and his crew in HMS *Captain* (74 guns) boarded and captured two Spanish ships-of-the-line in

HMS *Hibernia*, a first rate of 110 guns designed by Sir John Henslow and launched in 1804. She was an enlarged version of HMS *Ville de Paris*, which Henslow had designed a decade earlier.



succession. If required, one or two men from each gun were called away from their weapons to form a boarding party, and were armed with cutlasses, boarding pikes and pistols. When the two ships came alongside, grappling hooks tethered the combatants together, then after throwing a hail of grenades, the boarding party swarmed aboard the enemy ship and fought its crew in a hand-to-hand mêlée. Boarding actions were usually short, bloody and decisive.

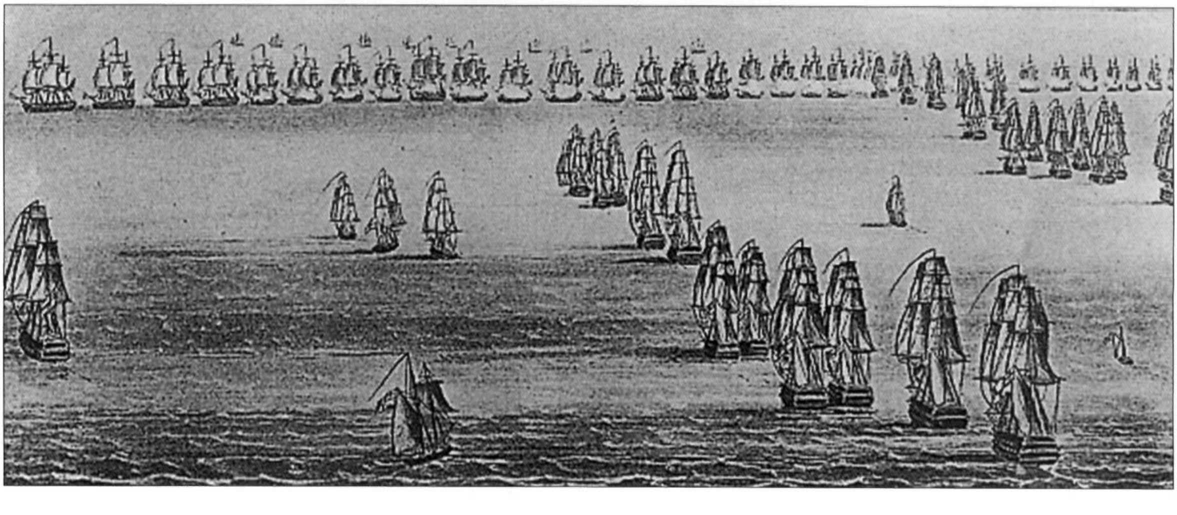


32-pdr. carronades and their crews, depicted on the quarterdeck of a ship-of-the-line during the bombardment of Algiers, 1816. Note the readily accessible ammunition box in the foreground.

The ship-of-the-line was designed to fight in a line-of-battle in a fleet action. Instead, for most of the war, they were used to blockade enemy ports such as Brest or Cadiz, which placed an immense strain on ships and crews. Five major fleet actions were fought during the French Revolutionary War, and one during the Napoleonic War. In each one, the battle was initiated by the enemy, either in an effort to unite their fleet using a break in the blockade, or to support their army overseas, or to sneak out and attack a British merchant convoy. The one exception was the battle of Copenhagen in 1801, when Nelson set out solely to destroy the Danish fleet.

Since the mid-17th century, a fleet action involved the rival fleets drawing up in lines, engaging the enemy until one side broke off the action. These battles tended to be indecisive, so in 1782, Admiral Rodney turned his line towards the enemy line, breaking it and isolating part of the French fleet. This resulted in a decisive victory, but the manoeuvre was risky, as it exposed the ships to enemy fire as they approached the enemy line-of-battle at an oblique angle. Admirals such as Jervis, Duncan and Nelson gambled with their fleets in this manner and as a result won a series of splendid victories. The ultimate example of this tactic was at Trafalgar in 1805, when Nelson pierced the Franco-Spanish line in two places, isolating two portions of the enemy fleet and initiating a close-range battle where the British superiority in gunnery could make itself felt. Nelson was not the inventor of these revolutionary tactics. He simply understood the potential and limitations of the ships under his command, and used his fleet accordingly.

In this depiction of the opening moves of the battle of Trafalgar the two divisions (or lines) of the British fleet are shown approaching the long line of Franco-Spanish ships-of-the-line. On the right of the picture, HMS *Royal Sovereign* and HMS *Belleisle* are about to break the enemy line.



THE FLEET 1792–1815

Note: Some of these vessels were 'in ordinary' – mothballed or undergoing extensive refits. Most of these returned to active service during the war. Date launched is in square brackets. Dozens of other ships-of-the-line were used in non-combatant roles, as prison ships, sheer hulks, etc., and have not been included in this list.

First rate ships-of-the-line (5 in total)

(All are 100-gun ships unless otherwise noted)
Britannia [1762] Renamed Princess Royal (1810), St. George (1812)
Queen Charlotte [1790] Blown up by accident 1800
Royal George [1788]
Royal Sovereign [1786]
Victory [1764 – rebuilt 1801]

First rate ships-of-the-line built between 1793 and 1815 (7 in total)

Ville de Paris [1795] (110 guns)
Hibernia [1804] (110 guns)
Caledonia [1808] (120 guns)
Queen Charlotte [1810] (104 guns)
Nelson [1814] (120 guns)
St. Vincent [1815] (120 guns)
Howe [1815] (120 guns)

Second rate ships-of-the-line (17 in total)

(All are 98-gun ships unless otherwise noted)
Atlas [1782] Harbour Service 1814
Barfleur [1768]
Blenheim [1761] (90 guns) Reduced to 74 guns in 1800 Wrecked 1807
Boyne [1790] Burned by accident 1795
Duke [1777] Harbour Service 1799
Formidable [1773] Scrapped 1813
Glory [1788] Prison Ship 1809
Impregnable [1786] (90 guns) Wrecked 1799
London [1766] Scrapped 1811
Namur [1756] (90 guns) Reduced to 74 guns in 1805 Harbour Service 1807
Prince George [1772]
Princess Royal [1773] Scrapped 1807
Prince [1788 – rebuilt 1796]
Queen [1769] Reduced to 74 guns in 1811
St. George [1785] Wrecked 1811
Union [1756] Hospital Ship 1799
Windsor Castle [1790] Reduced to 74 guns in 1814

Second rate ships-of-the-line built between 1793 and 1815 (8 in total)

Princess of Wales [1794]
Neptune [1797]
Temeraire [1798] Prison Ship 1813
Dreadnought [1801]
Ocean [1805]
Impregnable [1810] Training Ship 1810
Boyne [1810]
Union [1811]

Third rate ships-of-the-line of 80–84 guns (3 in total)

(All are 80-gun ships unless otherwise noted)
Cambridge [1755] Harbour Service 1793 Scrapped 1808
Gibraltar [1749] Ex Spanish Hulked 1813
Royal William [1719] (84 guns) Scrapped 1813

80-gun ships-of-the-line built between 1793 and 1815

Caesar [1793] Depot Ship 1814
Foudrayant [1798]

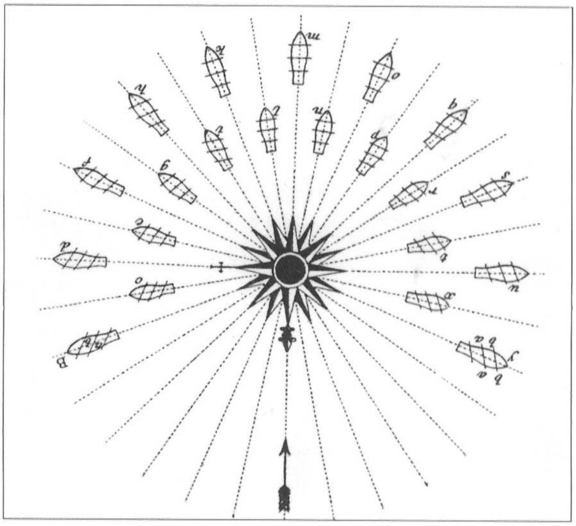
Third rate ships-of-the-line of 74 guns (64 in total)

Albion [1763] Floating Battery 1794 Wrecked 1797
Alcide [1779]
Alexander [1778] Hulked 1798
Arrogant [1761] Sheer Hulk 1801 Scrapped 1810
Audacious [1785] Scrapped 1815
Bedford [1775] Prison Ship 1801
Bellerophon [1786] Prison Ship 1815
Bellona [1760] Scrapped 1814
Berwick [1775] Captured 1795 Recaptured and wrecked 1805
Bombay Castle [1782] Wrecked 1796
Brunswick [1790] Harbour Service 1812
Canada [1765] Prison Ship 1810
Captain [1787] Harbour Service 1809 Burnt and scrapped 1813

Carnatic [1783] Renamed Captain 1815
Colossus [1787] Wrecked 1798
Conqueror [1773] Scrapped 1794
Courageux [1753] Ex French Wrecked 1796
Culloden [1783] Scrapped 1813
Cumberland [1774] Scrapped 1804
Defence [1763] Wrecked 1811
Defiance [1783] Prison Ship 1813
Edgar [1779] Prison Ship 1813
Egmont [1768] Scrapped 1799
Elephant [1786]
Elizabeth [1769] Scrapped 1797
Excellent [1787]
Fame [1759] Prison Ship 1799
Fortitude [1780] Prison Ship 1795
Ganges [1782] Prison Ship 1811
Goliath [1781] Reduced to 58 guns 1812 Scrapped 1815
Hannibal [1786] Captured 1801
Hector [1774] Prison Ship 1808
Illustrious [1789] Wrecked 1795
Invincible [1765] Wrecked 1801
Irresistible [1782] Scrapped 1806
Leviathan [1790]
Magnificent [1767] Wrecked 1800
Majestic [1785] Reduced to 58 guns 1813
Minotaur [1793] Wrecked 1810
Monarch [1765] Scrapped 1813
Montague [1779]
Orion [1787] Scrapped 1814
Powerful [1783] Scrapped 1812
Ramillies [1785]
Resolution [1770] Scrapped 1813
Robust [1764] Harbour Service 1812
Royal Oak [1769] Prison Ship 1796
Russel [1764] Sold 1811
Saturn [1786] Reduced to 58 guns 1813
Suffolk [1765] Scrapped 1803
Sultan [1775] Prison Ship 1797
Swiftsure [1787] Captured 1801 Recaptured 1805, and renamed Irresistible
Terrible [1785]
Theseus [1786] Scrapped 1814
Thunderer [1783]
Tremendous [1784]
Triumph [1757] Harbour Service 1813
Valiant [1757] Harbour Service 1799
Vanguard [1787] Prison Ship 1812
Venerable [1784] Wrecked 1804
Vengeance [1774] Prison Ship 1808
Victorious [1785] Scrapped 1803
Warrior [1781]
Zealous [1785]

74-gun ships-of-the-line built between 1793 and 1815 (81 in total)

Mars [1794]
Centaur [1797]
Ajax [1798] Burnt by accident 1807
Kent [1798]
Superb [1798]
Achilles [1798]
Northumberland [1798]
Renown [1798] Harbour Service 1814
Dragon [1798]
Spencer [1800]
Courageux [1800]
Conqueror [1801]
Plantagenet [1801]
Albion [1802]
Sceptre [1802]
Colossus [1803]
Hero [1803] Wrecked 1811
Illustrious [1803]
Repulse [1803]
Eagle [1804]
Swiftsure [1804]
Fame [1805]
Revenge [1805]
Magnificent [1806]

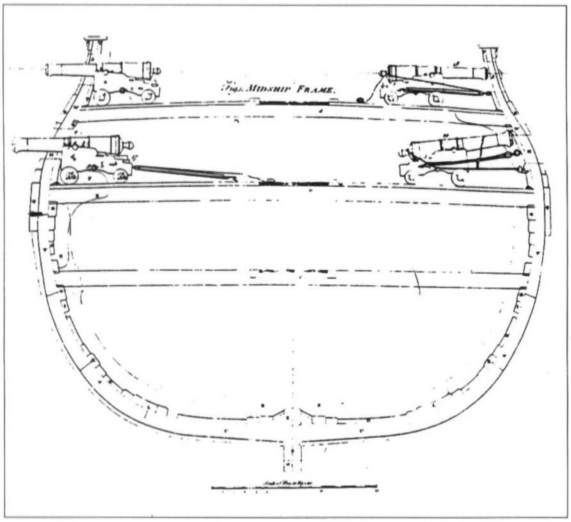


The main 'points of sailing' of a ship, showing the attitude of the sails in relation to the wind direction (here coming from the north). Diagram from W. Burney's *Universal Dictionary of the Marine* (London, 1815) (Author's Collection)

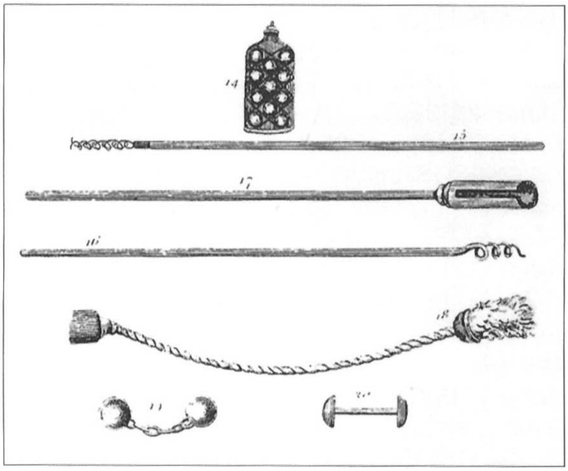
Valiant [1807]
Elizabeth [1807]
Cumberland [1807]
Warspite [1807]
Bulwark [1807]
Aboukir [1807]
Marlborough [1807]
York [1807]
Sultan [1807]
Bombay [1808]
Victorious [1808]
Invincible [1808]
Venerable [1808]
Blake [1808] Prison Ship 1814
San Domingo [1809]
Milford [1809]
Royal Oak [1809]
Ajax [1809]
Berwick [1809]
Rodney [1809]
Poitiers [1809]
Minden [1810]
Hannibal [1810]
Vigo [1810]
Cressy [1810]
Egmont [1810]
Armada [1810]
America [1810]
Vengeur [1810]
Conquestador [1810]
Edinburgh [1811]
Barham [1811]
Hogue [1811]
Duncan [1811]
Asia [1811]
Stirling Castle [1811]
Mulgrave [1812]
Cornwall [1812]
Dublin [1812]
Gloucester [1812]
Scarborough [1812]
Clarence [1812]
Anson [1812]
Pembroke [1812]
Rippon [1812]
Devonshire [1812]
Medway [1812]
Indus [1812]
Benbow [1813]
Cornwallis [1813]
Blenheim [1813]
Vindictive [1813]
Rochfort [1814]
Redoutable [1815]
Defence [1815]
Hercules [1815]
Wellesley [1815]

Third rate ships-of-the-line of 60–64 guns (37 ships in total)

Africa [1781] Hospital Ship 1798
Agamemnon [1781] Wrecked 1809
America [1777] Prison Ship 1800 Scrapped 1807
Anson [1781] Reduced to 44 guns 1794 Wrecked 1807
Ardent [1782] Blown up 1794
Argonaut [1779] Ex French Harbour Service 1797
Asia [1764] Scrapped 1804
Belliqueux [1780] Prison Ship 1814
Bienfaisant [1754] Ex French Scrapped 1814
Le Caton [1777] Harbour Service 1798 Sold 1815
Crown [1782] Prison Ship 1798]
Diadem [1782] Troopship 1798
Dictator [1783] Troopship 1798
Director [1784] Harbour Service 1796 Scrapped 1801



A midships cross-section of a third rate 74-gun ship-of-the-line designed by Sir Thomas Slade, from Falconer's *Marine Dictionary* (London, 1760). It shows the upper deck, the main gundeck and the orlop deck were supported by a system of knees and braces. (Author's collection)



Gun tools and ammunition, from D. & J. T. Serre's *Liber Nauticus* (London, 1805). From top to bottom, the engraving shows a case shot (grapeshot), a scouring worm, a ladle (rarely used), a worm, a flexible rammer/sponge, chain shot and barshot. (Author's Collection)

Europa [1765] Scrapped 1814
Indefatigable [1784] Reduced to 44 guns 1795
Intrepid [1770] Harbour Service 1810
Lion [1777]
Magnanime [1780] Reduced to 44 guns 1795 Scrapped 1813
Monmouth [1772] Prison Ship 1796
Nassau [1785] Troopship 1797 Wrecked 1799
Nonsuch [1774] Floating Battery 1794 Scrapped 1802
Polyphemus [1782] Powder Hulk 1813
Prothee [1772] Ex French Prison Ship 1799 Scrapped 1815
Raisonnable [1768] Receiving Ship 1810 Scrapped 1815
Repulse [1780] Wrecked 1800
Ruby [1776] Receiving Ship 1813
St. Albans [1764] Floating Battery 1803 Scrapped 1814
Sampson [1781] Hulked 1802
Sceptre [1781] Wrecked 1799
Scipio [1782] Scrapped 1798
Standard [1782] Harbour Service 1799
Stately [1784] Troopship 1799 Scrapped 1814
Trident [1768]
Veteran [1787] Prison Ship 1799
Vigilant [1774] Prison Ship 1799
Yarmouth [1748] (In Ordinary) Scrapped 1811

64-gun ships-of-the-line commissioned between 1793 and 1815 (5 in total)

Agincourt [1796] (ex East Indiaman) Prison Ship 1812
Ardent [1796] (ex East Indiaman) Harbour Service 1812
Monmouth [1796] (ex East Indiaman) Hulked 1815
York [1796] (ex East Indiaman) Foundered 1804
Lancaster [1797] (ex East Indiaman)

Fourth rate ships-of-the-line (50 guns)

There were also 19 fourth rate ships (50–60 guns) in service in 1793, but they were no longer considered ships-of-the-line. Most were used for convoy work, or as local guard ships. During the French Revolutionary War, fourth rates were occasionally used to augment main battle fleets. At the battle of Camperdown in 1797 the *Isis* and the *Adamant* brought up the rear of the British fleet, and at the battle of the Nile in 1798 *Leander* played a prominent part in the action (see Plate B). Two fourth rates (the *Glatton* and the *Isis*) participated in the battle of Copenhagen in 1801. No fourth rates were used in the line of battle during the Napoleonic Wars (1803–15).

Prizes

In addition, 48 captured ships-of-the-line were bought into service during the French Revolutionary War. An additional 33 ships-of-the-line joined the fleet during the Napoleonic Wars. Although most of these vessels were placed 'in ordinary', a number served with distinction against their former owners and allies. Dozens of other captured enemy vessels were not added to the fleet, but were either given to allies, scuttled, or sold as scrap. Only those that took an active part in the war are listed here.

Captured from the French and added to the Royal Navy (Date captured in square brackets)

(37 ships commissioned into service, of which only 14 saw any active duty)
Pompée [1793] (74 guns)
Commerce de Marseilles [1793] (120 guns) Prison Ship 1800 Sold 1802
Amerique [1794] (74 guns) Renamed Impétueux Scrapped 1813
Juste [1794] (80 guns) Scrapped 1811
Sans Pareil [1794] (80 guns) Sheer Hulk 1810

Formidable [1795] (74 guns) Renamed Belleisle Scrapped 1814
Tigre [1795] (74 guns)
Tonnant [1798] (80 guns)
Franklin [1798] (80 guns) Renamed Canopus
Hercule [1798] (74 guns) Scrapped 1810
Sparti [1798] (74 guns) Renamed Spartiate
Hoche [1798] (74 guns) Renamed Donegal
Athénein [1800] (64 guns) (Maltese) Renamed Athenienne Wrecked 1806
Guilliaume Tell [1800] (80 guns) Renamed Malta
Duquesne [1803] (74 guns) Scrapped 1805
Duguay Trouin [1805] (74 guns) Renamed Implacable Training Ship 1805
Formidable [1806] (74 guns) Renamed Brave Wrecked 1806
Mont Blanc [1805] (74 guns) Hulked 1811
Scipion [1805] (74 guns)
Jupiter [1806] (74 guns) Renamed Maida Sold 1814
D'Hautpoult [1809] (74 guns) Renamed Abercrombie
Rivoli [1812] (74 guns)

Captured from the Spanish and added to the Royal Navy (10 in total)

(11 ships commissioned into service, of which only 2 saw any active duty)
San Antonio [1801] (74 guns) Renamed San Antoine Prison Ship 1804
San Josef [1797] (112 guns)

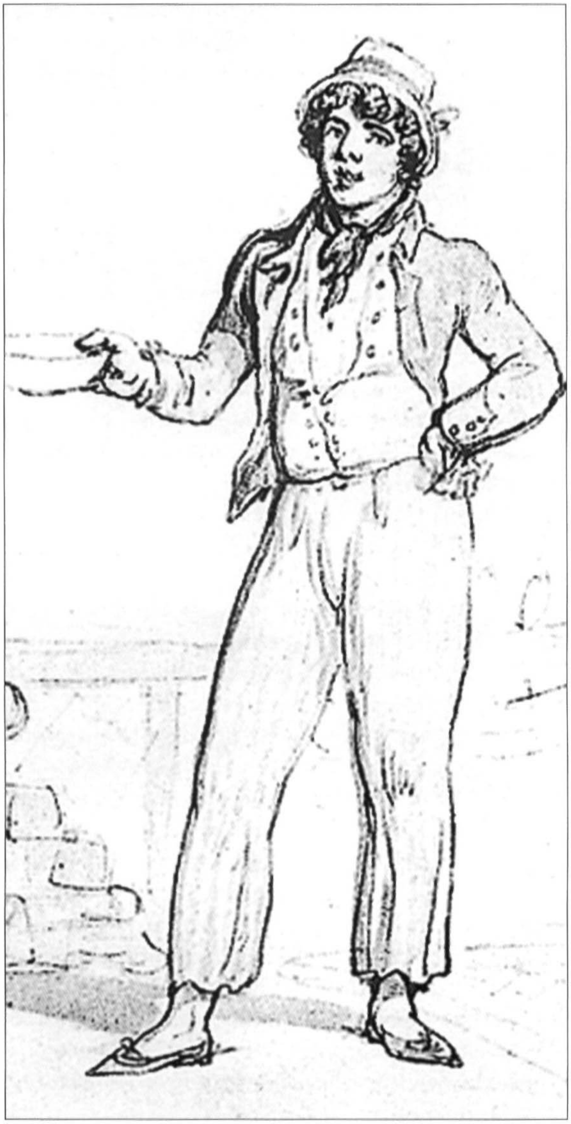
Captured from the Dutch and added to the Royal Navy

(15 ships commissioned into service, of which only 9 saw any active duty)
Overyssel [1795] (64 guns) Hulked 1810
Zealand [1796] (64 guns) Harbour Service 1803
Dordrecht [1796] (64 guns) Harbour Service 1804
Revolutie [1796] (64 guns) Renamed Prince Frederick Hospital Ship 1804
Admiral De Vries [1797] (68 guns) Harbour Service 1800 Sold 1806
Haarlem [1797] (68 guns) Harbour Service 1811
Wassenar [1797] (68 guns) Hulked 1804
Leyden [1799] (64 guns) Floating Battery 1805 Sold 1815
Cerberus [1799] (64 guns) Renamed Texel

Captured from the Danish and added to the Royal Navy

(16 ships commissioned into service, of which only 4 saw any active duty)
Christian VII [1807] (84 guns) Harbour Service 1809
Danmark [1807] (74 guns) Renamed Dannemark Sold 1815
Prindsesse Carolina [1807] (74 guns) Sold 1815
Norge [1807] (74 guns)

A British sailor, c.1799, from an aquatint by Thomas Rowlandson. He is well dressed, wearing his 'run-ashore' clothes or 'Sunday best'. (Private Collection)



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GLOSSARY

Blockade: The establishment of a naval presence off an enemy port, preventing enemy shipping entering or leaving the harbour.

Bowsprit: A spar protruding in front a ship's stem, used to support forestays, jib sails and spritsails.

Bracing: The process of `gle, then securing them in place as tightly as possible by ropes known as braces.

Brig: A two-masted square-rigged vessel with a lower fore-and-aft gaff-rigged sail carried behind her mainmast.

Broadside: The firing of all the guns on one side of the ship in a single volley.

Bulkhead: A temporary upright partition dividing cabins within a ship. These were usually taken down and stowed in the hold before the ship gave battle.

Cable tier: Storage areas in the hold where ropes (cables) were stowed. The largest was the tier designated for the anchor cable, which passed into it through holes in intervening decks.

Capstan: A man-powered winch used to raise the anchor, or to perform similar mechanical tasks on board a ship.

Carronade: A short, squat gun capable of firing a large shot in proportion to the size of the gun.

Cutter: A small single-masted warship rigged with fore-and-aft sails like a sloop, but with an extendable (running) bowsprit.

Fish tackle: Tackles were often rigged from masts, yards and rigging to lift heavy objects. The fish tackle was a tackle hooked to the foremast, and used to 'fish' (or raise) the anchor.

Forecastle: Short raised deck at the bow of a vessel.

Foremast: The forward mast of a ship.

Gunlock: A flintlock mechanism used as an ignition device for naval ordnance of the period.

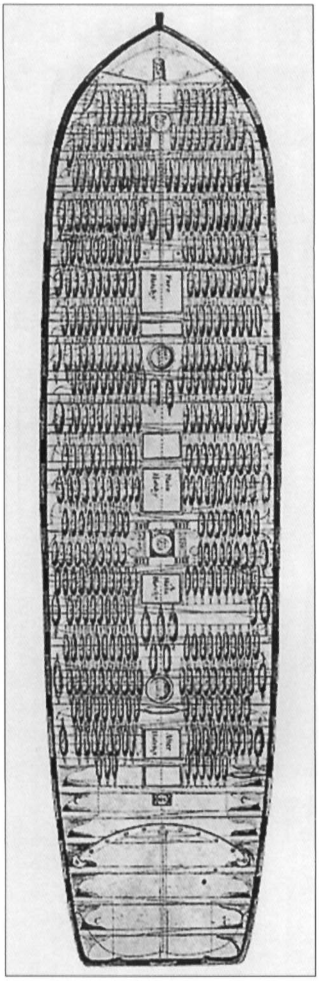

Diagram illustrating the arrangement for the hanging of hammocks on the lower gundeck of HMS *Bedford* (74 guns). As over 500 men had to sleep in hammocks on the ship, the allocation of hammock space was an important part of shipboard organisation.

Hull line: A plan or model showing the shape and curvature of the hull and frames in both side elevations and cross-sections, capable of being accurately measured and copied by the shipbuilders.

Jib: A triangular staysail stretched between the jib-boom or bowsprit and the foremast.

Messenger: A small cable stretched between the thick anchor cable and the capstan, and used to raise the anchor.

Mothballed: A ship which is decommissioned, but kept at anchor off a naval dockyard. In times of war, these 'mothballed' ships could be re-equipped and brought back into service.

Nipper: A nipper was a strop or clamp used to secure chain or cable once it was winched on board. It was clamped to another immobile section of chain or rope to prevent the cable being brought inboard from slipping.

Orlop: The deck below the lowest gundeck, which was usually used for storage.

Rake: Firing at an enemy with a vessel's broadside when the target is at right angles to the firing ship, and therefore unable to return fire.

Razéed: A term given to ships-of-the-line that had decks removed, turning them into lower, less-well armed but more seaworthy vessels.

Ring-breech: The ring at the rear of a naval gun used to secure the breeching rope, attaching the gun to the side of the ship.

Sharpshooters: Marksmen (both sailors and marines) armed with muskets, who fired at exposed enemy crewmen and officers during a naval engagement.

Sheer line: A model or plan showing the upward sweep of the hull planking from amidships to the stem and stern.

Ship's Muster Book: The listing of the ship's crew, which was used to record details of pay, duties and other pertinent administrative details.

Spanker: Also known as the 'driver', this was a gaff-rigged fore-and-aft sail mounted on the after edge of the lower rearmost mast of the ship. On a ship-of-the-line, this mast was the lower mizzen.

Sponge(r): A cylinder of wood wrapped with a fleece, and attached to a pole. It was used to swab down a gun after firing, to prevent accidental ignition from any burning wadding which remained in the barrel. The term was also given to the seaman who used the tool.

Studdingsails: Additional sails, mounted on the outside of a warship's normal square sails, and carried on extensions fitted to the yards. They provided extra sail area and therefore speed.

Tack: A sailing course, determined by which side of the vessel the wind comes from (i.e. larboard or port tack, starboard tack). Tacking is the process of changing the head of the ship across the direction of the wind from one tack to the other.

Touch-hole: The vent on a cannon.

Veering tier: Veering is an alternative nautical word for slackening off a rope or cable. The veering tier was an area below decks where the anchor cable was coiled, and prepared for letting go.

Wearing: To bring a ship around from one tack to the other by sailing away from the wind, then steering towards it on the opposite tack. In effect the result is similar to tacking, but the ship's head never crosses the direction of the wind.

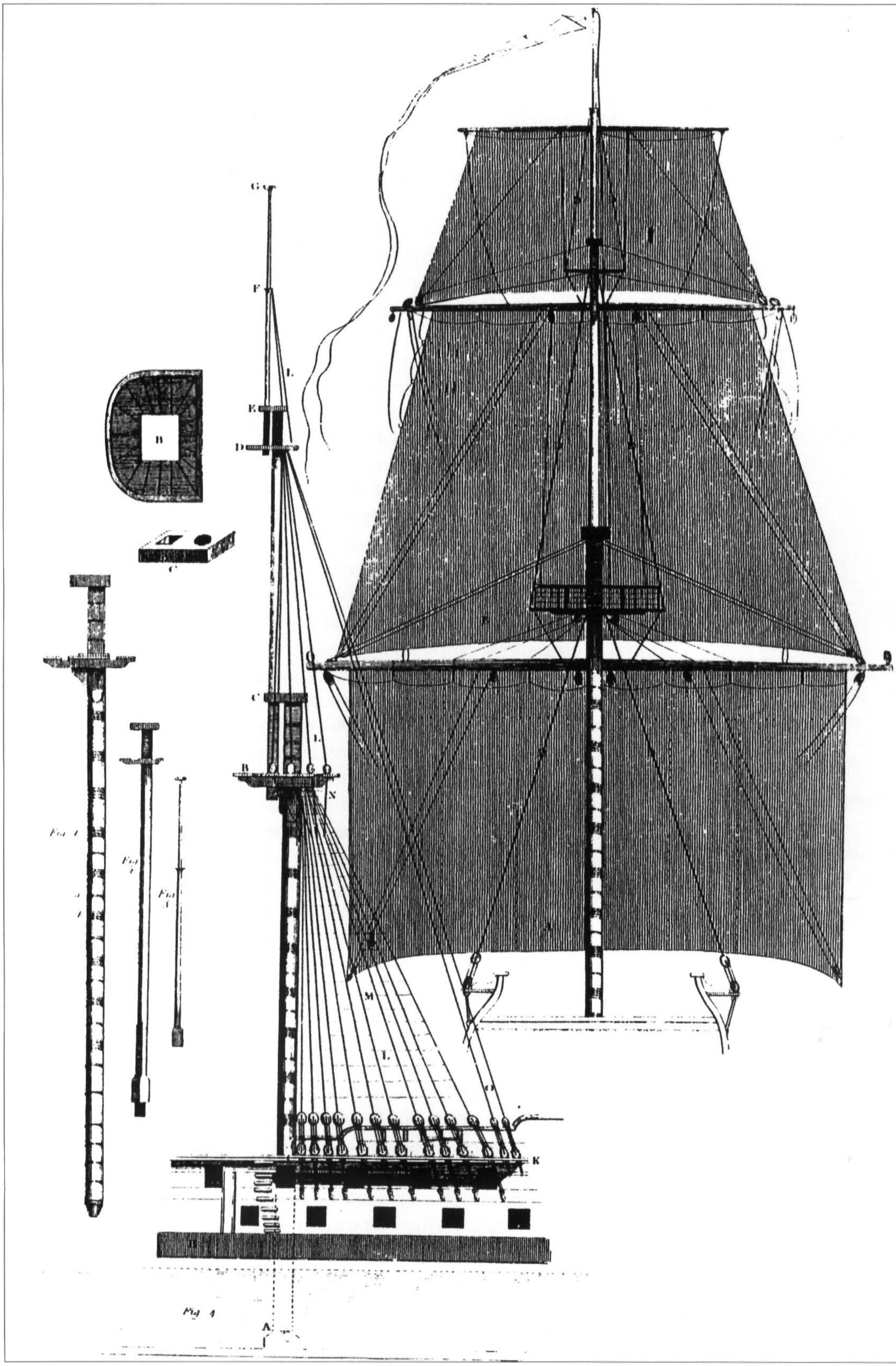
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Fig 3
Fig 4

COLOUR PLATE COMMENTARY

PLATE A: HMS *AGAMEMNON* (THIRD RATE, 64 GUNS), C. 1801

Built in Buckler's Hard, the *Agamemnon* was one of five 64-gun ships of the Ardent class designed by Sir Thomas Slade during the American Revolution. She was launched on 10 April 1781 and proved a well-found and responsive ship that was admired by her captains. Captain Horatio Nelson commanded the *Agamemnon* in an engagement off Genoa in 1795 which led to the capture of the French *Ça-Ira* (74 guns). Under Captain Sir Edward Berry she was one of three 64-gun ships-of-the-line at Trafalgar in 1805. This distinguished warship was wrecked off the River Plate on 20 June 1809.

Displacement: 1,384 tons
Length overall: 160 ft
Keel length: 131 ft 8 in
Beam: 44 ft 4 in
Draught: 18 ft
Armament: 26 x 24-pdrs., 26 x 18-pdrs., 12 x 9-pdrs.

Sail Plan

The plate shows the sail plan for a typical square-rigged ship-of-the-line during the period. The square sails are as follows;

1. Spritsail
2. Fore topgallant
3. Fore topsail
4. Fore course (or foresail)
5. Main topgallant
6. Main topsail
7. Main course (or mainsail)
8. Mizzen topgallant
9. Mizzen topsail
10. Driver

In addition to the square sails, the *Agamemnon*, like other ships-of-the-line, could hoist royal sails above her topgallant sails, and add studdingsails to extend the size of the square sails on her main yards. In addition fore-and-aft sails were fitted between the mainmasts and bowsprit. Up to four jibs stretched from bowsprit or jib boom to the foremast; five staysails could be raised between foremast and mainmast; and three more staysails could be fitted between the mainmast and the mizzen. In addition, the driver could be augmented by a spanker.

PLATE B: HMS *LEANDER* (FOURTH RATE, 50 GUNS) AT THE BATTLE OF THE NILE, 1798

Built in Chatham as part of the Portland class designed by Sir John Williams, the *Leander* was launched on 1 July 1780. By 1793 she was considered too small to form part of the line of battle. At the start of the French Revolutionary War, the *Leander* was 'in ordinary' in Portsmouth, but she was re-commissioned, and eventually sent to join the Mediterranean fleet.

Displacement: 1,044 tons
Length overall: 146 ft
Keel length: 119 ft 9 in
Beam: 40 ft 6 in
Draught: 17 ft 6 in
Armament: 22 x 24-pdrs., 22 x 12-pdrs., 8 x 6-pdrs.

In May 1798, Admiral Bruey's French fleet left Toulon, bound for Egypt. The fleet escorted a transport flotilla containing Napoleon and 36,000 troops, who were duly landed near Alexandria. Bruey's fleet of 13 ships-of-the-line and four frigates then anchored in nearby Aboukir Bay. Admiral Nelson pursued the French across the Mediterranean, and surprised them at anchor on 1 August 1798. Bruey's fleet were anchored in line astern, and were largely unprepared for battle.

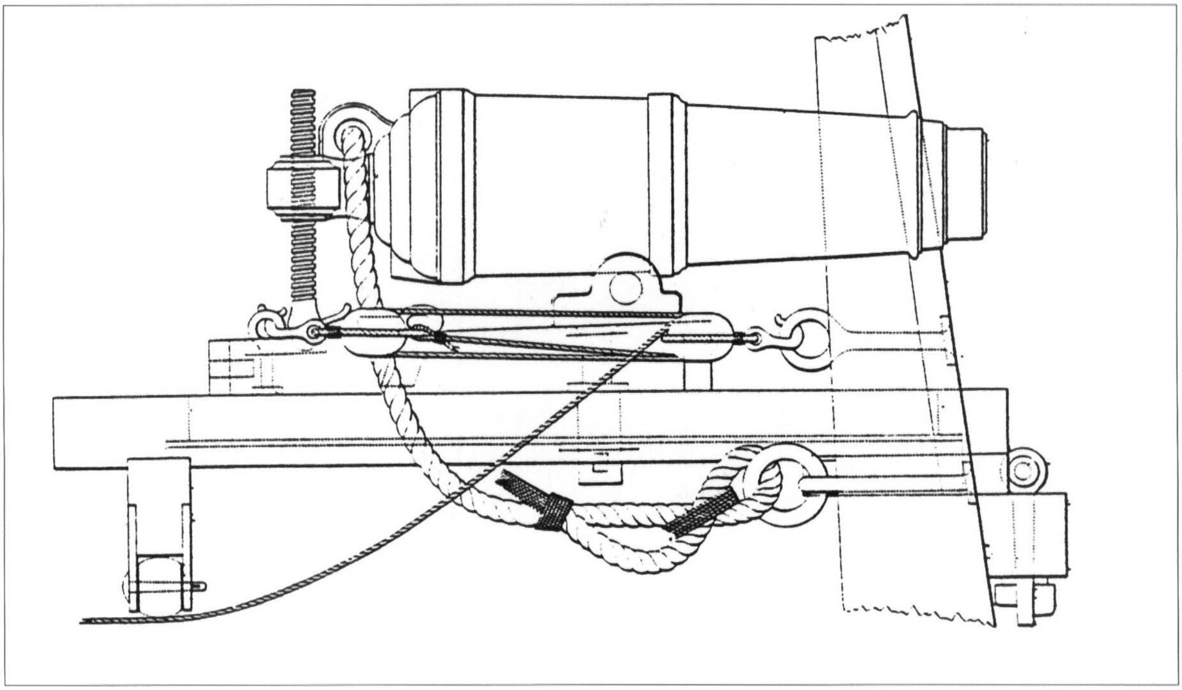
Nelson attacked at 6.20 pm, concentrating on the head of the French line. He commanded 14 ships-of-the-line, all 74-gun vessels apart from the 50-gun fourth rate, HMS *Leander*. The *Peuple Souverain* (74 guns) cut her cables and drifted inshore, so Captain Thompson sailed the *Leander* into the gap in the enemy line and dropped anchor. He was in an ideal position to rake the *Aquilon* and *Franklin* (both 74 guns). Both ships eventually surrendered, together with eight other ships-of-the-line and two frigates. Bruey's flagship *L'Orient* (120 guns) blew up during the action, taking the admiral and most of her crew with her. The plate depicts the Leander at around 10 pm, raking the battered Aquilon in the foreground. Following the battle, the *Leander* was sent home with despatches, but on 18 August she was captured after a protracted fight with the French *Le Genereux* (74 guns), one of the few French ships to escape the debacle at Aboukir. She was recaptured the following year, and was hulked in 1806.

PLATE C: HMS *CAESAR* (THIRD RATE, 80 GUNS), C. 1801

Built in Plymouth, and launched on 16 November 1793, the *Caesar* was designed by Sir Edward Hunt. She was the only vessel in her class, and one of only two 80-gun ships launched during the period. Hunt had initially planned to build her as a large 74-gun ship based on the design of the French *Formidable*, but changed her design during construction. Although powerful, she was not particularly successful, as her hull was prone to 'hogging' (bending). In 1803 she was refitted and additional bracing was added to support her hull. She spent much of her career as a flagship of independent squadrons, and served as the flagship of Rear-Admiral Sir James Saumarez during his skirmish with a French squadron off Algeciras on 6 July 1801, and again during his night action against a Franco-Spanish fleet on 12–13 July. Two Franco-Spanish ships were captured, and two more blew up during the action. In 1814 the *Caesar* was decommissioned, converted into a depot ship, and finally scrapped in 1821.

Displacement: 1,991 tons
Length overall: 181 ft
Keel length: 148 ft 3 in
Beam: 50 ft 3 in
Draught: 22 ft 11 in
Armament: 30 x 32-pdrs., 32 x 24-pdrs., 18 x 9-pdrs.

OPPOSITE **This simplified depiction of the arrangement of the mainmast of a ship-of-the-line shows how the three portions of the mast were secured to each other, and the location of the 'fighting top'. (Author's Collection)**



A 32-pdr. carronade on its pivoting carriage, with attendant tackle, from Charles Dupin, *Voyages dans la Grand Bretagne* (Paris, 1821). These 'ship-smashers' augmented the short-range firepower of British ships. (Author's Collection)

The plate shows the sleek hull lines of the *Caesar* and the configuration of her gunports, with one more port on each side of her upper gundeck, and two more on either side of her quarterdeck. The inset depicts a 32-pdr. gun of the Blomefield pattern, with its attendant equipment and breeching ropes. Guns of this type were carried on the *Caesar* as well as on most 74-gun ships-of-the-line.

1. Flexible rammer and sponge
2. Assorted hand spikes
3. Powder cartridge
4. Vent pricker
5. Powder horn
6. Gun lock

PLATE D: HMS *VICTORY* (FIRST RATE, 100 GUNS), C. 1805

Built in Chatham and launched on 7 May 1765, the *Victory* was the only first rate designed by Sir Thomas Slade. She was extensively refitted in 1801, and on 21 October 1805 she served as the flagship of Vice-Admiral Horatio Nelson at the battle of Trafalgar. Although hulked in 1822 she survived until 1922, when she was placed in a dry dock in Portsmouth and preserved. She remains on display today as a living example of the majesty of the British ships-of-the-line of Nelson's navy.

Launched: 7 May 1765
Displacement: 2,142 tons
Length overall: 186 ft
Keel length: 151 ft 4 in
Beam: 52 ft
Draught: 21 ft 6 in
Armament: 30 x 32-pdrs., 28 x 24-pdrs., 30 x 12-pdrs., 12 x 6-pdrs.

PLATE E HMS *BELLEROPHON* (THIRD RATE, 74 GUNS), C. 1805

The *Bellerophon* was built in the private Graves Yard at Frindsbury in Kent (across the Medway from Chatham Royal Dockyard), and was launched on 17 October 1786. She formed part of the Arrogant class of ten 74-gun ships, originally designed by Sir Thomas Slade. Together with her sister ships, the *Bellerophon* proved an excellent design, combining good sailing qualities with a powerful armament. Contemporaries regarded these 'Common' 74-gun ships as superior to many of the 'Large' 74-gun vessels commissioned after 1781. Many of the Arrogant class warships were present in the major fleet actions of the period. The *Bellerophon* participated in the battle of the First of June (1794) when she was badly damaged, the battle of the Nile (1798), and the battle of Trafalgar (1805). After a distinguished wartime career she was decommissioned and turned into a prison ship in 1815, and was sold to the breakers in 1836.

Displacement: 1,643 tons
Length overall: 168 ft
Keel length: 138 ft
Beam: 46 ft 9 in
Draught: 19 ft 9 in
Armament: 28 x 32-pdrs., 28 x 18-pdrs., 14 x 9-pdrs.

The plate shows the *Bellerophon* stripped of her sails, revealing the arrangement of her masts, yards and standing rigging. This has been simplified in order to emphasise the primary shrouds, stays and backstays of her standing rigging. Each of the three masts (foremast, mainmast and mizzen mast) were divided into three sections; the lower mast, topmast and the topgallant mast. The yards on each mast were the topgallant yard, the topmast yard and the main yard, while royal yards could be fitted above the topgallants. The exception was the mizzen main yard, which was called the crossjack. The driver sail was fitted to the mizzen gaff (top yard) and the spanker boom (lower yard), extending behind the mizzen mast. The bowsprit was extended by a jib-boom, and it supported the spritsail yard below it.

PLATE F: HMS *BELLEISLE* (THIRD RATE, 74 GUNS) AT THE BATTLE OF TRAFALGAR, 1805

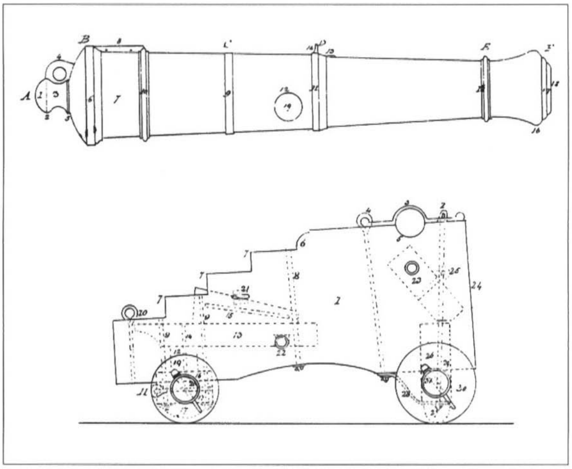
The *Belleisle* (sometimes written Belle Isle) was originally called the *Formidable*, and was built in Rochefort in France. She was launched in 1793, but was captured two years later in an action off the Ile de Groix (23 June 1795). She was renamed, and commissioned into the Royal Navy. Although she did not participate in any major fleet action for another decade, she played a vital part in the blockade of the enemy coast. Her moment of glory came on 21 October 1805, at Trafalgar. She was refitted after being badly damaged in the battle, and continued to serve in blockading squadrons until she was scrapped in 1814.

Displacement: 1,889 tons
Length overall: 184 ft 5 in
Keel length: 149 ft 5 in
Beam: 48 ft 9 in
Draught: 21 ft 7 in
Armament: 30 x 32-pdrs., 30 x 24-pdrs., 14 x 9-pdrs.

At Trafalgar she was commanded by Captain William Hargood, and was the third ship in the British lee column of attack, led by Vice-Admiral Collingwood in HMS Royal Sovereign (100 guns). The plate depicts the battle soon after the *Belleisle* pierced the Franco-Spanish line. Behind her, the *Royal Sovereign* is shown exchanging point-blank broadsides with the Spanish *Santa Anna* (112 guns), which she captured, while the Spanish *San Justo* (74 guns) fires in support of the Spanish first rate. In the foreground the French *Fougeuex* (74 guns) is shown racing to intercept the *Belleisle*. The *Belleisle* had to fight off a cluster of Spanish and French ships-of-the-line before being rescued by HMS *Tonnant* (74 guns) and HMS *Bellerophon*. Bloodied but unbowed, the *Belleisle* was dismasted, and a quarter of her crew were killed or wounded during the battle.

PLATE G: HMS *CALEDONIA* (FIRST RATE, 120 GUNS), C. 1812

Built in Plymouth, the *Caledonia* was launched on 25 June 1808, some 12 years after she was first ordered. She was therefore commissioned too late to take part in any of the fleet actions of the Napoleonic War, but served as the flagship of a blockading squadron. She was designed by Sir William Rule, and was the only ship in her class. The *Caledonia* reflected the move towards larger and more powerful ships, encouraged by improvement in naval engineering and new systems of bracing, which allowed for longer hulls. She was some 19 ft longer than HMS *Victory*, and displaced 440 more tons than Nelson's flagship at Trafalgar. Unlike many of the ships built during the war, the *Caledonia* was a success, being a fast, weatherly ship, which performed well under sail. Later 120-gun first rates such as the *Nelson*, *Howe* and *St Vincent* were modified versions of the *Caledonia* (all launched 1814–15), but somehow they failed to match the performance of their predecessor. Two more Caledonia class first rates (the *Britannia* and the *Prince Regent*) were laid down in 1812 as exact copies of the *Caledonia*, but the war ended before they were completed. The original *Caledonia* remained in active service for another half century, and was decommissioned after the Crimean War (1854–6). She was finally scrapped in 1875.



A 24-pdr. long gun of the Blomefield pattern, and its attendant gun carriage. The 'breeching rope' was threaded through the ring above the cascable. (Author's Collection)

Displacement: 2,616 tons
Length overall: 205 ft
Keel length: 170 ft 11 in
Beam: 53 ft 6 in
Draught: 23 ft 2 in
Armament: 32 x 32-pdrs., 34 x 24-pdrs., 34 x 18-pdrs., 8 x 12-pdrs.

The plate shows the hull lines of this, the most powerful British warship of the Napoleonic Wars, as she appeared at the start of the War of 1812. By this stage the traditional yellow and black colour scheme of British ships-of-the-line had been replaced by a white and black scheme, which became widely known as the 'Nelson chequer'). Her 12-pdrs. were replaced by 32-pdr. carronades around this period, and the inset shows one of these powerful guns, mounted on its unique pivoting carriage system. From 1798, most new ships-of-the-line were issued with 32-pdr. carronades for their quarterdeck instead of their standard armament of long guns. These 'ship-smashers' were devastating at short range, and although they had a maximum range of over 1,000 yards, they were usually fired at ranges of less than 400 yards. The cut-away depiction of the ship's longboat clearly demonstrates her sturdy construction.

INDEX

Figures in **bold** refer to illustrations

1745 establishment 7

action, service in **11**, 22-23
  preparations for 34-35
Adamant, HMS (fourth rate, 50 guns) 18, 40
Admiralty, the 5, 7, 9, 10
Agamemnon, HMS (third rate, 64 guns) **A**, 12, 45
Ajax class **17**
American Revolution, the (1775-83) 8, 12-13
Amiens, Peace of, 1801 13
Anson, Lord 7-8
Ardent class 8
armament **C**, 5, 6, 7, 8-9, 22, 24, **24**, 33(table), 46, **47**
  carronades **G**, 5, 9, 24, 33, **36**, **46**, 47
  firing procedure 33-34
  first rates 14, 14-15
  second rates 15, 16
  third rates 16, 17, 18

Baltic, the 12
Bately, Sir William 7-8
Bedford, HMS (third rate, 74 guns) **43**
Belleisle, HMS (third rate, 74 guns) **F**, 47
Bellerophon, HMS (third rate, 74 guns) **E**, 46-47
Bellona, HMS (third rate, 74 guns) 8
blockade duty **7**, 36
boarding actions **3**, 35-36
bomb vessels 4
Boyne, HMS (second rate, 98 guns) 16, **21**, **34**
Boyne class 14
Britannia, HMS (first rate, 100 guns) 14

Caesar, HMS (third rate, 80 guns) **C**, 9, 16, 45-46
Caledonia, HMS (first rate, 120 guns) **G**, 9, 14, 15, 47
Cambridge HMS (third rate, 80 guns) 16
Camperdown, battle of, 1796 18, 40
Cape St Vincent, battle of, 14th February 1797 35-36
Captain, HMS (third rate, 74 guns) **3**, 35
captured vessels 9, 16, 18, 40-41, 47
Colossus class 9
colour scheme 47
Commerce de Marseilles, the (120 guns) 15
Common class **12**, 17, 46
construction 10-12
cooks **18**
Copenhagen, battle of, 2nd April 1801 18, 36, 40
cost 6
Courageaux, the (third rate, 74 guns) 8, 9
crews 5, 6, 20-21
  accommodation **6**, **43**
  stations 22
Crimean War (1854-6) 47

decks, construction 11
decommissioning **4**
design and development 6-10
discipline 19
dockyards
  private 12
  royal **8**, 11, 13
Dublin class 7
Dutch Wars, the 4

East India Company 12, 18
Egmont, HMS (third rate, 74 guns) **12**

fifth rates 5
firepower 5, 15
first rate ships of the line 5, 6(table), 9, 10, 11, 14-15, 21, 24, 33(table), 37. *see also* individual vessels
Foudrayant, HMS (third rate, 80 guns) 16
fourth rate ships of the line 5, 18, 40 *see also* individual vessels
France 3, 9
Freemantle, Captain Thomas **22**
French Revolutionary War (1793-1802) 4, 9, 13, 16, 18, 20, 36, 40
frigates 5

Gibraltar, HMS (third rate, 80 guns) 16
Glatton, HMS (fourth rate, 50 guns) 18, 40
Gloucester, HMS (third rate, 74 guns) **17**
'guardships' 13
gun crews 22, 33, 34, **35**
  tools **C**, **40**, 46

Henslow, Sir John 9, 16
Hibernia, HMS (first rate, 110 guns) 14, **35**
Howe, HMS (first rate, 120 guns) 47
hulls 6-7, 9-10, 45
  construction 10-11
  first rates 14
  third rates 18
Hunt, Sir Edward 8, 9, 14, 45

idlers 21-22
Impress Service, the 20
'in ordinary' (mothballed) 4, 13
Intrepid class 8
Invincible, HMS (third rate, 74 guns) 17
Isis, HMS (fourth rate, 50 guns) 18, 40

Large class 17, 18
launching 11
Leander, HMS (fourth rate, 50 guns) **B**, 4, 18, 40, 45
longboats **G**, 47

maintenance duties **20**
manoeuvrability 23-24
marines 19, 20, 21, 22-23
masts **E**, **44**, 47
midshipmen 19, 23, 33

Napoleonic Wars, the (1803-15) 3, 4, 13, 20, **33**
Nassau, HMS (third rate, 64 guns) 8
Navigation Acts 3
Navy Board, the 7
Navy Office, the 7
Nelson, HMS (first rate, 120 guns) 47
Nelson, Horatio (1758-1805) **3**, 34, 35, 36, 45
Neptune class 16
Nile, battle of the, 1st-2nd August 1798 **B**, 4, **10**, 18, 40, 45, 46
Northumberland, HMS (third rate, 74 guns) **5**

Ocean, HMS (second rate, 98 guns) 15, 16
officers 4, 19-20, 21, 23, 33, 35
organisation, shipboard 21-23

Panther HMS (fourth rate, 60 guns) 18
Peake, Sir Henry 10
points of sailing **38**
Pompée class **13**

prizes 40
promotion 19, 21

Queen Charlotte HMS (first rate, 100 guns) 14, 15
Quiberon Bay, battle of, 20th November 1759 8

rating system 4, 4-5, 6(table), **15**
recruits and recruitment 20
Rodney, Admiral 36
role 4, 5, 6, 9
Royal Naval College, Dartmouth 3
Royal Sovereign, HMS (first rate, 100 guns) 14
Royal William, HMS (third rate, 80 guns) 16
Rule, Sir William 9, 10, 47

sailors **6**, 20, **41**
sails **A**, **14**, 23, **23**, 45
Salvador del Mundo, the (112 guns) 15
San Josef, the (120 guns) 15
seamanship 23-24
seapower, importance of 3
second rate ships of the line 5, 6(table), 11, 15-16, 21, 24, 33(table), 37 *see also* named vessels
Seppings, Sir Robert 10
Seven Years War, the (1756-63) 4, 7, 17
shot 33, **40**
sixth rates 5
size 4, 9, 10
Slade, Sir Thomas 7-8, 14, 17, **19**, 46
social divisions 20
Spain and Spanish vessels 9, 15
speed 23
St Vincent, HMS (first rate, 120 guns) 47
strakes (planks) 11
strength 4, 6, 12-13
Surveyor of the Navy 7, 10
Surveyor's class 12, 13, **16**, 18
Swiftsure, HMS (third rate, 74 guns) 12

tacking 23-24
tactics 4, 6, 34, 35, 36, **36**
third rate ships of the line 5, 6(table), 7, 11, 16, 21, 24, 33(table) *see also* named vessels
  60-64 gun 18, 39-40
  74-gun **14**, 17-18, **23**, 37-39, **39**
  80-84 gun 16, 37
timber 6, 12
Trafalgar, battle of, 21st October 1805 **F**, 18, 36, **36**, 45, 46, 47
training, gunnery 34

un-rated vessels 5, 7
Union, HMS (second rate, 98 guns) 16

Vanguard, HMS (third rate, 74 guns) **10**
Venerable, HMS (third rate, 74 guns) **11**
Victory, HMS (first rate, 100 guns) **D**, 6, 8, 14, 15, 33, 46, 47
Ville de Paris, HMS (first rate, 110 guns) **9**, 14

War of 1812 (1812-15) 34
wardroom, the **17**
watches 21-22
Williams, Sir John 8
wind, use of 23

York, HMS (third rate, 74 guns) **4**

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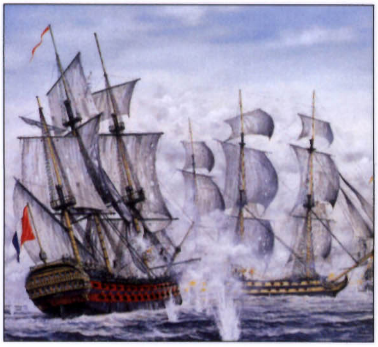

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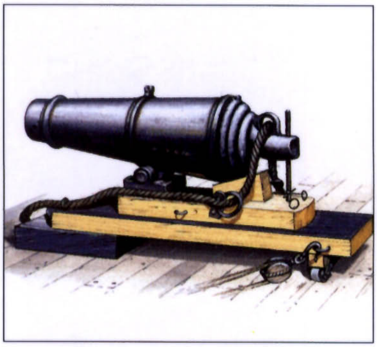

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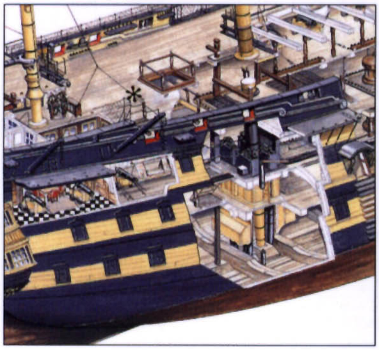

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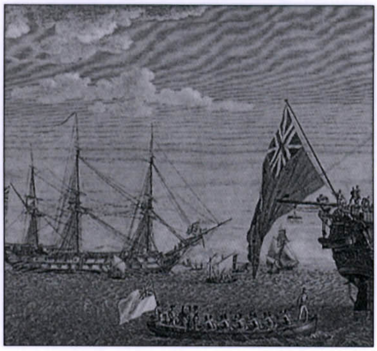

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